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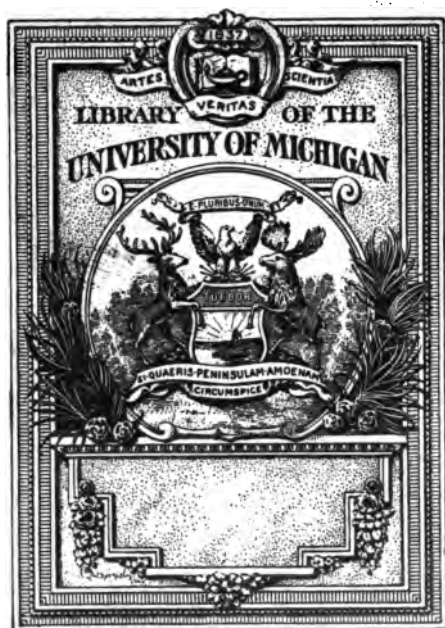
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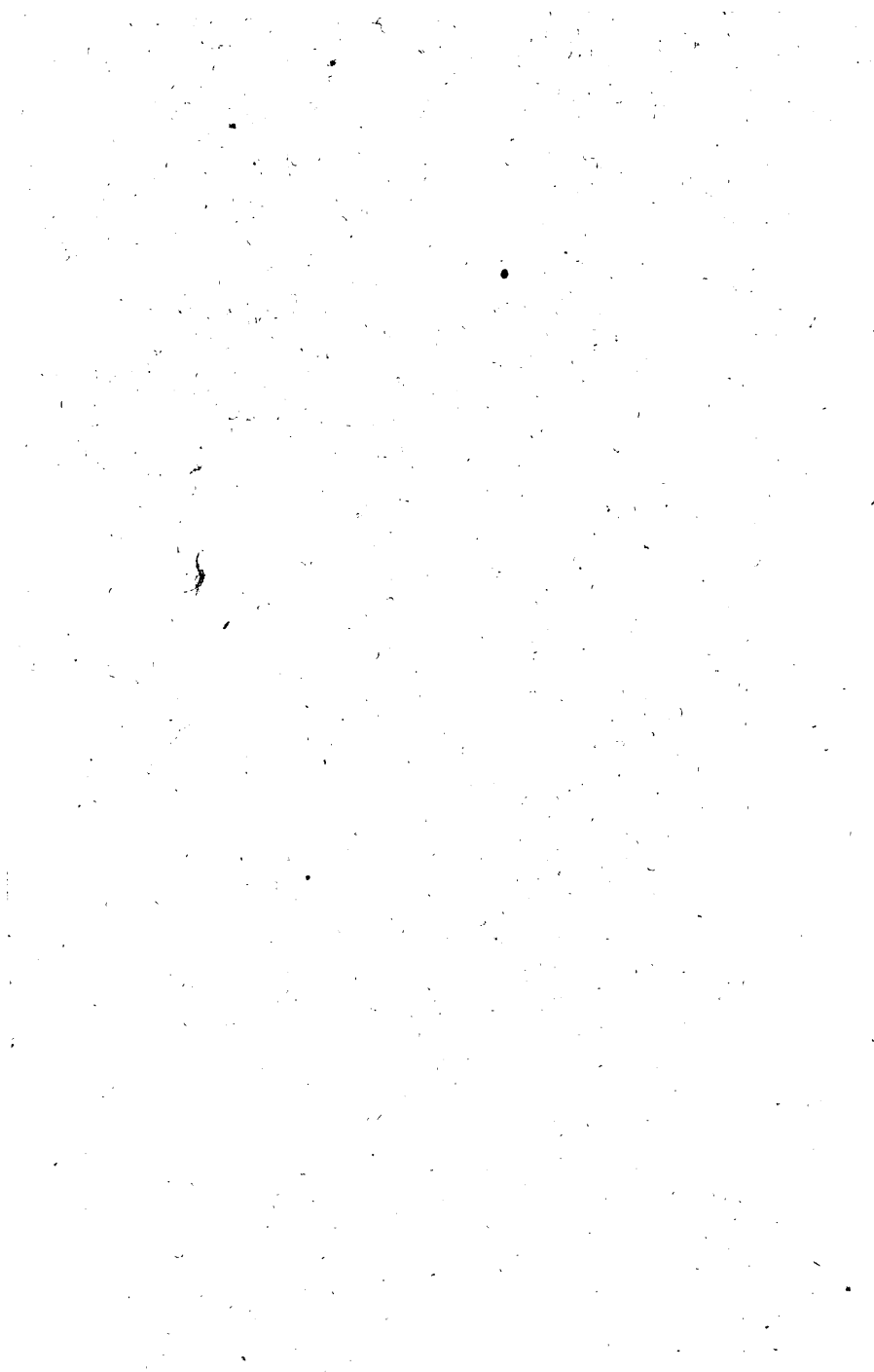
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NOTES

ON THE

NORTHWEST

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OR

VALLEY OF THE UPPER MISSISSIPPI.

COMPRISING THE COUNTRY BETWEEN LAKES SUPERIOR AND MICHIGAN, EAST; THE ILLINOIS AND MISSOURI RIVERS, AND THE NORTHERN BOUNDARY OF THE UNITED STATES;—INCLUDING IOWA AND WISCONSIN, PART OF MICHIGAN NORTHWEST OF THE STRAITS OF MACKINAW, AND NORTHERN ILLINOIS AND MISSOURI.

William
BY
John Alden
WM. J. ALDEN. BRADFORD.

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INTRODUCTION.

0927 R.M.
THE present work covers, in part, new ground geographically :—and differs in design, plan, and mode of treatment, from those that have before appeared descriptive of some portions of the district of which it treats.

Though for more than a century and a half known to the French Missionaries, the voyageurs, and the coureurs des bois, and to those few who went out as discoverers and explorers, yet it was almost wholly an unknown region to our American geographers only twenty years since. Mr. Darby, in his Gazetteer date 1827, says that much of the portion west of the Mississippi is unknown.

Recd Calw. Miss. 1-31-36
Most of the books that have been published in relation to this country, have been designed only for *guides* to travellers and emigrants ;—and have consequently been subject, so far as the general reader has been concerned, to the twofold objection that they were too much in detail to be of interest to them, or to embody that kind of information, in that shape, that would be valuable ;—and also that by the rapid transitions constantly in progress in this part of the country, they very soon became antiquated and not to be confided in

for present information, and possess only the value of a past year's almanac ; the fate necessarily of books of mere details.

The country of which the present volume treats is one of great interest intrinsically, and especially at this time when two new sovereignties are about to be established within its limits. And the object of the writer has been, to put together some notes upon it, in such form as will be interesting to persons seeking general information in relation to the United States, and of such a kind as will be more permanent than the usual chapters of detail.

The physical geography of a country will, of course, remain unchanged, while the descriptions of towns given to-day will hardly apply to the same place when the earth shall come again to the same place in its orbit.

The same is true of the history of a country. What has transpired will not be effaced by a new page, but what is once written will remain.

The other portions of the work are not of so permanent a nature, yet a considerable portion of the remaining three parts will not very soon become obsolete. The population and municipalities, the state of society, and the pursuits of the people, will undergo modifications. They are, however, made to occupy a subordinate place in the work.

The physical description of the country has been drawn almost exclusively from two sources : the writer's own observation, and the very excellent and graphic report of Mr. Nicollet to the Topographical Bureau of the War Department of the United States : from which, being the only published description of a considerable portion of this country,

narrated in very animated style, large extracts have been transcribed literally, as better than a reproduction in new shape.

The history has been collected from a variety of sources : some of them of undoubted authenticity. Some of the older relations, however, to which resort must be had to ascertain the early events connected with the discovery of the country, are not to be received without caution. The practice among the French of publishing books in names of other persons, not the authors of them, has thrown doubts over some of its story. M. Tonti disclaimed the authorship of the volume published in his name ; and it is probable the same liberty may have been taken with others.

Parts III. and IV. are principally the result of the writer's observation, aided in some particulars by Mr. Wetmore's Gazetteer of Missouri, by a contribution of a gentleman of Wisconsin, and by some few public documents.

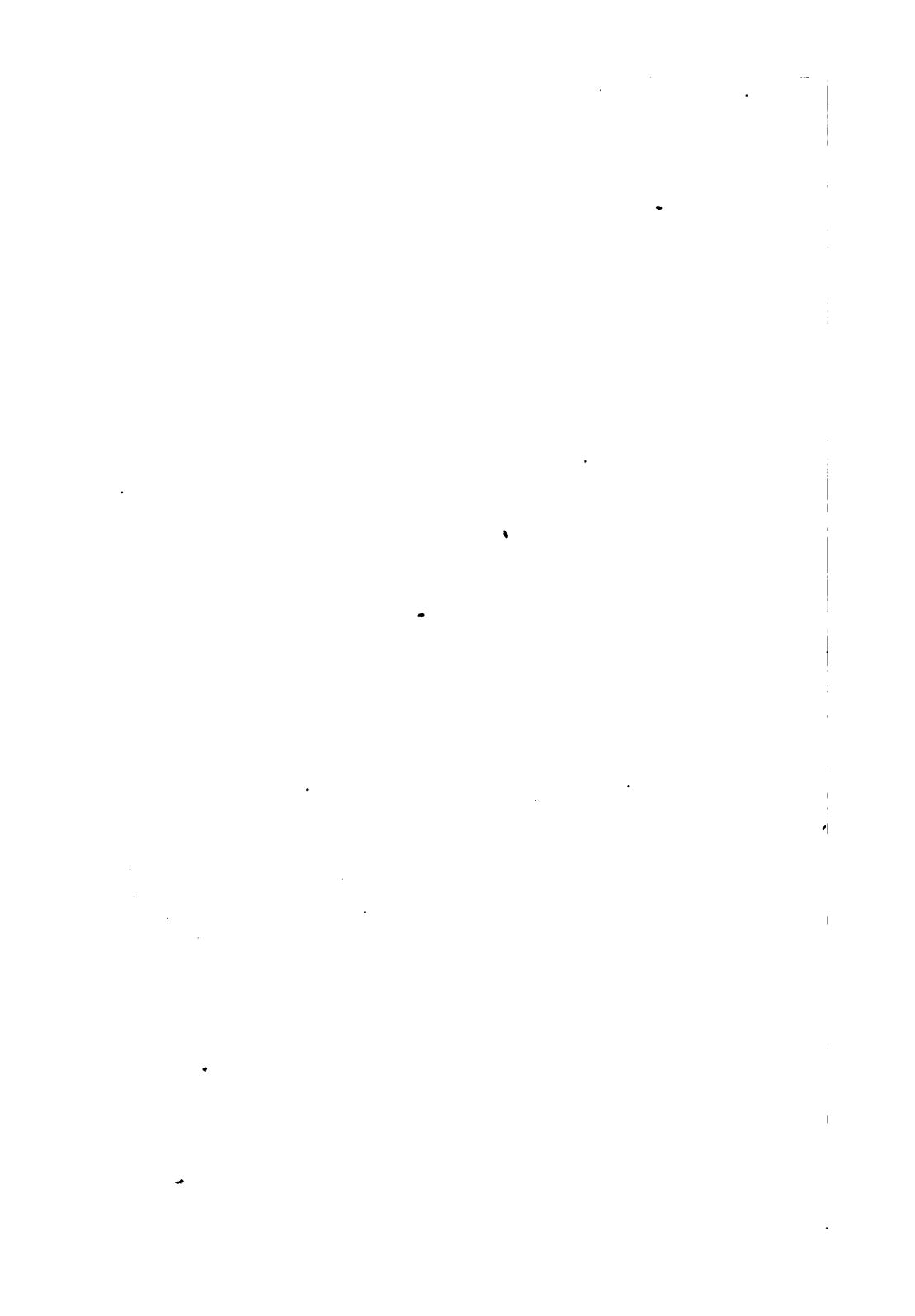
The reports of Mr. Owen and Nicollet, being very full and correct on the geology of this region, large extracts from them have been transcribed in the Appendix, and that part of the volume consists of little else than extracts from these reports and Mr. Keating's descriptions. These form the most complete and satisfactory account of the geology of the district that can be furnished ; and it was thought best to insert them literally. On that account this has been placed in the Appendix, though the subject would make it more appropriate to the body of the work. In the Appendix also is a very curious and interesting extract from Mr. Owen's Report, giving a minute description of some earth work

monuments in Wisconsin. These two portions of the Appendix consist of matter suitable to the body of the work :—and to many readers will have more interest than I dare to hope for the original matter. The only reason for placing them in the Appendix is that they are not original matter. This will be a sufficient apology to most readers for the length of the Appendix.

The design of the work is to make an instructive volume for the library—and at the same time, though not strictly a guide, yet more useful to the emigrant than a book of mere details can be, by imparting to him those general ideas of the country which will be always of no less value than a knowledge of minute particulars in relation to certain places.

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PART I.

PHYSICAL GEOGRAPHY.

THIS country (west of Lake Michigan) was almost unknown to geographers twenty years ago. The report of Rev. J. Morse to the Secretary of War, in 1821, states that in 1819 there were but three families settled from the mouth of the Illinois up two hundred and forty miles, and Darby, in his *Gazetteer* (2d edit., 1827), says, "of this immense region" (included between Lakes Michigan and Superior, Rivers Mississippi and Red, the State of Missouri and the northern boundary of the United States) "much remains unknown, and of those parts that have been explored, our information is generally imperfect." [*Verb. Michigan.*] Galena was settled in 1828; and in 1833, after the Black Hawk war, settlements began on Rock River and the northern parts of Illinois and in Iowa, upon the tract purchased of the Sacs and Foxes. In the list of rivers flowing into the Upper Mississippi, in the same work, are several defects and errors. On the right side, Root and Wabsipinicon and Checagua (or Skunk) are omitted; and that now known to the inhabitants of Iowa as Tête des Morts, is called Galena. On the left, some considerable streams are not named. The falls of St. Anthony are placed, in the same authority, in latitude 44°, which is one degree south of their true situation.

It is said that the list is given mostly on the authority of Schoolcraft, and they are also *more minutely detailed from the*

circumstances that the valley of the Mississippi is yet imperfectly known, of great importance in the geography of the United States, and that the source of intelligence is recent and respectable. Mr. Darby well said that the knowledge of this region was imperfect; for we are informed by Mr. Schoolcraft, to whom he refers as a source recent and respectable, that the Rock River Rapids extend six miles up the river. Their length is, in fact, fifteen miles. Another striking instance of the errors in regard to this country, is in the statement of Mr. Brackenridge, that the St. Peter's enters the Mississippi *forty* miles below St. Anthony, and is navigable *one thousand* miles to its source—when, in fact, it is nine miles from the falls, and its whole length is less than five hundred miles. In some maps of this country, still more recent, published within twelve years of the time of writing this, there also appear similar inaccuracies. It is, in fact, only since the termination of the Black Hawk war, and the settlement of the country consequent thereon, that it has become known to geographers and to the world.

The country which is here intended to be included in the name of the Northwest, or the Upper Mississippi valley, is bounded on the east and southeast by the Lake Michigan and the waters connecting it with Lake Superior, and by Illinois River; on the south, southwest, and west, by the Missouri River; and on the north by the line separating the territory of the United States from the British Possessions. It comprehends about 10° of latitude, from 39° to 49° , and 14° of longitude, from 87° to 101° (10° to 24° from Washington), and contains about 300,000 square miles. A large part of this tract, consisting of the northern portion, is still held by the Indians; and the Notes, excepting those relating to the geography, history and climate, will, for the most, apply to its remaining, or southeastern portion.

This country has some very peculiar natural features. The most remarkable of these is the innumerable multitude of lakes that spangle its northern surface, the remains, no doubt, of a vast sea that once covered the whole country extending north from the Gulf of Mexico, and perhaps reaching to Hudson's Bay.

Besides this, there are two great natural features belonging to the Valley of the Upper Mississippi, which perhaps are never fully realized but by actual inspection. The first consists in the uniformity of elevation, and the shape of the surface. The country, from the outlets of the Illinois and Missouri to St. Peter's, and from the Lake Michigan to Council Bluffs, and beyond that point westerly, is a vast plain, slightly inclining, ascending to the north and to the west. By observations taken between the Mississippi and the Lake, the elevation above the Atlantic has been found a little exceeding 500 feet: and west of the river, in the same parallel, toward the Missouri, something over 700 feet. At St. Peter's it is about 700. Nicollet states, as the result of over one hundred observations taken at Camp Kearney, near Council Bluffs, that that point is 1037 feet above the Gulf; and the elevation of Rock Island, in the same latitude, on the Mississippi, he says, is 528; and the height of Fort Pierre Chouteau, on the Missouri, he states at 1456; and the lower end of Lake Pepin, in the same latitude ($44^{\circ} 24'$), 710. The mouth of St. Peter's, in about latitude 45° , 744 feet. There are a few elevations above the general range, called mounds: but with the exception of these, the surface is marked only by ravines running from the general level down to the beds of the streams, which are usually from 100 to 200 feet lower.

The other remarkable prominent feature is the vegetable covering of the surface. There are large tracts of country

wholly destitute of tree or shrub, and covered only with a luxuriant growth of wild grass, and beautifully interspersed with flowers of every hue and variety, each successively making the prairie to look gay with their presence from April to October. This beautiful natural meadow is not more pleasant to the eye, than it is genial to the culture and grateful to the toil of man. It consists of a very dark brown vegetable mould, in appearance like a mixture of the light feathery part of ashes with a rich ooze. It is mellow beyond the conception of those who are acquainted only with the hard, stiff soils of the Atlantic slope, and as rich and productive as it is mellow. It is turned over by a prairie plough running on wheels and set to cut the turf in a regular and uniform parallelogram, about three inches thick, and fifteen or eighteen inches wide. This ploughing should be done during the springing of vegetation, or one of the three summer months; though May would usually be considered better than August for the operation. If done in May or June, it will, in some cases, be ready for a fall sowing, the same year. This mould is from one and a half to two feet deep usually, and sometimes more than that; and for whole sections, for several townships of six miles square in extent, a person could not find more gravel in the same quantity of mould than in his flour barrel. Below this rich mould is a subsoil, which seems not unsuitable to cultivation, being similar in appearance to the soil of the timbered lands, a yellow light clay, or clay loam. The country is a limestone formation. The timber is only on the streams, and consists of elm, ash, black walnut, butternut, maple, mulberry and iron wood on the bottoms, and on the upland white, red, black, and burr oak, shell bark and common hickory, with occasionally linden, birch, wild plum and cherry, locust, and some other. On the Wisconsin and St. Croix are heavy

growths of pine, and for several years past a great business has been carried on upon the Mississippi in getting lumber down from those regions to the towns along the river.

The best portions of this Upper Mississippi Valley are upon the western shore of Lake Michigan, including the eastern portion of Wisconsin; the Illinois and Rock rivers, and their tributaries; the Mississippi on both sides; and generally the whole of Iowa. In Iowa the prairies are less extensive than in Illinois, and the proportion of wood is greater. In the southern portion of Iowa, below the Iowa River, the soil is more stiff than to the north of that river, where, by a slight admixture of fine sand, it is made more friable and mellow. By reason of this quality, and being also, for the most part, more level, the land south of that river retains its moisture later in the spring, and the soil thus loses the advantage of time which the climate would give in the difference of latitude.

The soil of the prairie is deeper, and is said also to be richer at a distance from timber than in its vicinity. By scientific examination, it has been found that carbonate of lime enters into its composition in proportion of from twenty to forty per cent. In timber lands the proportion is much less. The first settlers, however, take the timber land for the convenience of fuel and other improvements. Thus the best land is actually the first taken. The soil is of such fertility, that in a few years, if the fires are kept out, there will be an abundant growth for all purposes. In the *Gazetteer of Missouri*, by Dr. Beck, published in 1823, it is stated that St. Louis county is generally prairie: yet, in fifteen years after that date, it was almost wholly covered with a thrifty growth of timber. The same is the case with other places.

The following statement of the geological structure of that

portion of Illinois known as the military bounty tract, situated in the northern part of the State, is extracted from a volume called "Illinois in 1837." As it is applicable to all the valley of the Upper Mississippi, with very slight variations, a very accurate idea may be derived from it of the structure of any portion of that country. In Iowa generally the vegetable mould at the top is a little thicker than it is here stated:—

"A scientific gentleman who has recently examined the central parts of the Military Bounty Tract, has given the following as the geological structure of the upland prairies in that region. That the same general structure prevails throughout the entire peninsula (between the Illinois and Mississippi Rivers), and all the central and northern parts of the State, is most probable. 1st. Vegetable mould, formed by the decomposition of grass upon the original clay soil, eight to thirty inches : 2d, pure yellow clay, three to eight feet : 3d, gravelly clay, mixed with pebbles, four to ten feet : 5th, limestone rock, two to twelve feet : 5th, shale, covering a stratum of bituminous coal, generally four to five feet thick : 6th, soapstone ; then sandstone. The bed of limestone seems to be universal in this region, it having been discovered in all the wells that have been dug, and in all the banks of water-courses of any magnitude."

Although no part of this region can with propriety be denominated hilly, yet upon the Wisconsin, Fox, the head waters of Rock and Milwaukie Rivers, the country is considerably diversified with hills, or rather swells, and valleys. The only hills worthy of particular notice, not only in this vicinity, but in the whole section under consideration, are the Ocooch and Smoky Mountains, which are broad and elevated ridges rather than mountains. The former is situated about twelve miles north of the Wisconsin, one hundred miles above its mouth; and the latter about forty miles south of the portage

between the river just mentioned and Fox River of Green Bay. (Long's Expedition, v. ii., p. 335.) The blue mounds, near the Wisconsin; the Platte mounds, near Platteville; the Pilot-knob, near Galena; the Table mound, three miles south of Dubuque; Sherald's mound and Pike's mountain, may also be named among the lesser elevations of this region, as also Sinsinewa mound. There are some elevations also near the right bank of the Mississippi, above Lake Pepin; and, in fact, on both sides in that part of the country. The Coteau des Prairies is an extensive and elevated tableland, dividing the waters which flow into the Missouri from those falling into the St. Peter's and Mississippi. A range of highlands extends from the Ocooch, on the Wisconsin, to Lake Superior, supposed by Long and Dr. James to be a continuation of the Ozark mountains. The northern section of this highland usually goes under the name of Porcupine Hills.

"It is neither a mountainous, nor a hilly, nor an absolutely flat country," says Nicollet, "exhibiting undulations of the surface that are not entitled to these usual appellations. There are hillocks, swells and uplands, but they have a longitudinal and horizontal rather than a vertical projection. In other words, it is a beautiful arrangement of upland and lowland plains, that give it an aspect *sui generis*. The first Frenchmen who explored it, and the British and Americans who followed them, were so forcibly impressed with this novelty in the appearance of the topography, that they employed new names to designate it. Hence we have the expressions *coteau des prairies*, *coteau des bois* [*highland prairie*, *highland woods*], *hauteur des terres* [*summit of land*], and rolling, flat, or marshy prairies. There is still sufficient variety in the irregularities of its surface, and the distribution

of the water-courses, woodlands and prairies, to bestow interest and value upon its several sub-divisions.

“The basin of the Upper Mississippi is separated, in a great part of its extent, from that of the Missouri, by an elevated plain, the appearance of which, seen from the valley of the St. Peter’s, or that of the Rivière Jacques, looming, as it were, a distant shore, has suggested for it the name of *coteau des prairies*. Its more appropriate designation would be that of *plateau*, which means something more than is conveyed to the mind by the expression, *a plain*.

“Its northern extremity is in lat. 46° , extending to 43° ; after which it loses its distinctive elevation above the surrounding plains, and passes into rolling prairies. Its length is about two hundred miles, and its general direction N.N.W. and S.S.E. Its northern termination (called ‘*tête du coteau*,’ in consequence of its peculiar configuration) is not more than fifteen to twenty miles across; its elevation above the level of the Big Stone Lake is 890 feet; and above the ocean 1,916 feet. Starting from this extremity (that is, the head of the coteau), the surface of the plateau is undulating, forming many dividing ridges, which separate the waters flowing into the St. Peter’s and the Mississippi from those of the Missouri.

“Under the forty-fourth degree of latitude the breadth of the coteau is about forty miles, and its mean elevation is here reduced to 1,450 feet above the sea. Within this space its two slopes are rather abrupt, crowned with verdure, and scalloped by deep ravines thickly shaded with bushes, forming the beds of rivulets that water the subjacent plains. The coteau itself is isolated in the midst of boundless and fertile prairies, extending to the west, to the north, and into the valley of the St. Peter’s.

“The plain, at its northern extremity, is a most beautiful

tract of land, diversified by hills, dales, woodland and lakes : the latter abounding in fish. The region of country is probably the most elevated between the Gulf of Mexico and Hudson's Bay. From its summit, proceeding from its western to its eastern limits, grand views are afforded. At its eastern border, particularly, the prospect is magnificent beyond description, extending over the immense green turf that forms the basin of the Red River of the North, the forest-capped summits of the *hauteurs des terres* that surround the sources of the Mississippi, the granite valley of the Upper St. Peter's, and the depressions in which are Lake Travers and the Big Stone Lake.

"The other portions of the coteau, ascending from the lower latitudes, present pretty much the same characters. This difference, however, is remarkable : that the woodlands become scarcer, whilst the open prairies increase in extent. It is very rarely only that groves are met with, to which the N'dacotahs, or Sioux, have given the name of Tchan Witah, or Wood Islands. When these groves are surrounded by water, they assume some resemblance to oases, and hence I have assigned this name to some of them on my map.

"These oases, possessed of a good soil, well wooded, offering an abundance of game, and waters teeming with fish, offer inducements for permanent settlements. In this region there are frequent instances of a marsh or lake furnishing waters to different hydrographical basins,—a fact observed by the Sioux, and which they express in the compound word of their dialect, *mini-akipan-kaduzza* ;*—from *mini*, water ; *akipan*, division, share ; and *kaduzza*, to flow, to run out." [Nicollet, pp. 7, 8, 9, 10.]

* Mr. Nicollet seems to mistake the application of the phrase *mini-akipan-kaduzza*. Akipan is probably a ridge of land, or, as the white settler calls it, in the very word of the Indians, a divide. The phrase is pro-

The country from Platte River to Council Bluffs is thus described by Nicollet [p. 39, et seq.] :—

“It will be recollected that I have represented the whole bed of clay, divided into two portions by a band of iron-stone, as having a nearly uniform thickness of 200 feet, and that it is intermixed with lumps of gypsum and limestone, together with nodules of pyrites; so that a soil, produced from such materials, could hardly be expected to throw up anything but a meagre vegetation. It is of a character, too, to be so acted upon by atmospheric agents, as to exhibit, by the wear and tear of its superficial portions, every variety of fanciful summits—domes, cupolas, towers, colonnades, &c.; imparting to it a remarkably picturesque appearance, especially when contrasted with the dense vegetation that borders the river, and a narrow slip of prairies crowning the summits of the hills that are seen to extend themselves on either side.

“The same physical causes, under other circumstances, produce new effects, that add to the beauty and grandeur of the scenery. Thus, the rains furrow and cut through the plastic and seleniferous clay, down to the most resisting limestone, giving rise to a sort of advancing platform, with a perpendicular elevation of from 30 to 40 feet, resembling a succession of long lines of parapets.

“But I have now reached the proper place to treat of a very interesting phenomenon observed in the midst of this cretaceous group. It manifests itself by the occasional appearance of a dense smoke at the top of some conical hill, or along a line of country bounded by the horizon, so

bably applied to a ridge, and not to a marsh. So Nicollet has himself applied it on his map to the ridge separating the waters of St. Peter's from those of the Mississippi.

as to awaken the idea of distant volcanoes; hence I have chosen to call them *pseudo-volcanoes*

"The smoke from these hills and the crevices in the plastic clay is said to last at the same spot for a long time—say two or three years; indicating at them a large accumulation of combustible materials. It is not, to my knowledge, accompanied by luminous vapors, and is silently wafted along the valley which it mournfully shrouds. The observance of this phenomenon, associated with the frequent recurrence of a peculiar light and spongy stone that the Missouri carries down and strews along its shores, and which has been mistaken for pumice-stone, has led to the often-controverted opinion that there was a volcanic region on the Upper Missouri. There are, however, no *true* volcanoes over any portion of the United States east of the Rocky Mountains; and it was this belief that led me to the adoption of the word *pseudo-volcano*. Neither is the substance found in these regions, and commonly called pumice, a true pumice; and, by a similar analogy to that which has prompted the name of its probable origin, I have called it a *pumiciform* stone (*roche pumiciforme*).

"Before proceeding to account for the appearances and circumstances attending these smoking hills, I must add a few more facts concerning their traditional and recorded history. There were none in activity when I ascended the Missouri in 1839; and so would seem to have been the case at the passage of Lewis and Clark at the beginning of this century. But, previous to my arrival, since the memorable expedition last referred to, and during a period of three years, they were seen, as my information goes, by many intelligent persons engaged in the fur-trade, all of whom are naturally observant, and most of them of unquestionable authority. I have no doubt, therefore, of the existence of

these hills ; and, in truth, upon a distance of 130 miles from Scalp mountain to beyond the *Karmichigah*, or Great Bend, there is nothing to be seen but a *black zone*, known to the voyageurs as '*les côtes brûlées*'—'*collines brûlées*,'—viz : burnt bluffs, or burnt hills.

" In other respects, the character of the vegetation, which is always scant upon this zone, indicates, in a measure, the epochs when it was visited by these subterranean fires ; the blacker and more sterile parts being the most recently burnt. They are pointed out by the voyageurs, and I have indicated several on my map. The fossil shells, that I have preceded-ly enumerated, lose their brilliant opalescent appearance, and are partly calcined, though still preserving their specific distinctions. Layers of the clay are also met with, so altered as almost to deserve the mineralogical name of porcellanite ; in fact, all the minerals belonging to the formation exhibit the alteration which might be supposed produced by exposure to that sort of action now to be assigned.

" I believe that these pseudo-volcanic phenomena may be compared with those described as occurring in other portions of the globe, under the name of *terrains ardens* ; although they are not here accompanied by the emission of flames. They are evidently due to the decomposition, by the percolation of atmospheric waters to them, of beds of pyrites, which, reacting on the combustible materials, such as lignites and other substances of a vegetable nature in their vicinity, give rise to a spontaneous combustion ; whilst further reactions (well understood by the chemist) upon the lime contained in the clay bed, produce the masses and crystals of selenite that are observed in the lower portion of this interesting deposit. This is the theory which, with some little confidence, we have formed of these pseudo-volcanoes.

" It may be interesting to future travellers to learn that,

in order to collect both fossils and most interesting specimens of crystallized selenite, without taking the trouble of making diggings, it is only necessary to perambulate the zone of plastic clay shortly after it has been washed by heavy rains. Under such circumstances, should they be favored moreover by the reflections of the sun, they will be struck with the appropriateness of the designation of these hills, as applied both by the voyageurs and Indians—namely, of *shining mountains*. In truth, it is not unlikely that these hills, a portion of them attaining an elevation of from 500 to 700 feet above the river, were some of those referred to by the Sioux of the Mississippi, who, conversing with the first white men who visited them, and long afterwards with Capt. Carver, spoke of the Shining Mountains of the West.

“These (so named) pseudo-volcanoes are not, however, confined to the valley of the Missouri. Traces of them are not unfrequently found over the more westerly regions, as far as the upper portions of the rivers called by the Indians *Mankizitah* and *Washtey*. The name of *Mankizitah-watpa*, usually translated by that of “White-earth-river” (or simply White river), means, more properly, Smoking Earth river; whence I have concluded that these indications of *pseudo-volcanoes* were at the same time evidences of the recurrence of the upper members of the cretaceous formation, the limit of which I have assigned as being somewhere eastward of the Black Hills. The name of ‘Mauvaises Terres’ (bad lands) has been applied to districts cut up into deep and intricate chasms, from which the traveller could hardly hope to extricate himself without the assistance of a good guide, and that are doubtless due to the burning out of their pseudo-volcanoes.

“However this may be, there can be no doubt that the region of country drained by these rivers which I have last

mentioned, will present a wide and fertile field of discovery to any geologist whose good luck it may be to give it a thorough exploration. For there he will find an opportunity not only of studying the continuation of the secondary cretaceous formation previously described, but likewise of discovering the approach to a *tertiary* formation; the equivalents of which are doubtless to be found to the west of the Rocky Mountains, as they have already been to the east, on the Atlantic borders."

This country is probably one of the most remarkable on the earth, for the variety and abundance of its mineral deposits, and especially for those which are of most extensive use in the arts. The sulphuret of lead occupies about one degree of latitude, extending north from a point on the Mississippi, some eight miles below Galena, and lying on both sides, varying in width till it covers as great an extent from east to west. On the east side of the river the mineral is found principally in a clay matrix, at a depth of sometimes only five or six feet from the surface; on the west side of the river it runs at the depth of one hundred feet or more, overlaid with magnesian limestone. To the south-west of the lead deposit is a very abundant bed of iron, extending from the Maquoqueta River south and west to the Wabesepinicon, in the counties of Jackson and Clinton, in Iowa. The extent of this mineral deposit is not known, but is probably forty miles or more northeast and southwest, with a breadth not less than twenty or thirty miles. The copper region extends north from the lead deposits to Lake Superior. Its precise limits are not known, but it embraces about 300 miles square; it is found south of latitude 43° , in large quantities, and beyond 47° north. From east to west it has an equal extent, being found in situ on Blue Earth river, west of the Mississippi, in 94° , and east as far as

between 88° and 89°. Probably in nearly the whole tract between the Rivers Wisconsin and St. Croix, and the Mississippi and Lake Superior, it is very abundant.

To the south of the lead region, that is, on Rock River, on the east, and south of the Wabesepinicon, on the west of the Mississippi, is a vast bed of bituminous coal (called by Owen the great Illinois coal field), of a good quality, at no great distance below the surface. The country is principally of magnesian limestone formation. The rock is, for the most part, covered with several successive layers of clay, each of the depth of many feet, and is generally not found in digging the wells of greatest depth. At the bluffs of the Mississippi, however, and on some other streams, it outcrops. The superstrata of clay are covered with a pure vegetable mould, unmixed with other matters, of a depth from eight or ten inches to three feet or more. In some localities, as at Iowa City, are deposits of a fine madrepor or encrinitic marble. The country has not yet been explored sufficiently to inform us to what extent these abound, nor how great a variety of minerals it contains. Mineral salt, and saltpetre, are to be considered among them.

The country has about all the varieties of forest trees common to the same latitudes on this continent; including five or six species of oak, the walnuts, ashes, maples, elms, hickories, locusts, mulberries, aspens, and poplars, one variety of which is very abundant, known as the cotton wood, &c. There are very few birches, and the writer has not seen any beeches or chestnuts. Of wild plums, the varieties are almost endless; many of them are good, some nearly equal to the best cultivated plums, some indifferent. Ironwood is abundant on the bottoms.

The prickly ash, hawthorn, grape, and gooseberry, are among the shrubs and vines. The vegetation is not only

varied according to the latitudes, but by the respective situations of bottom and upland. But the vegetation of the Mississippi and Missouri rivers, on the same parallel, does not appear to vary much. On the east of the Mississippi the coniferæ are found in a lower latitude than to the west of it. Nicollet says, in reporting the characteristics of the country, in his progress up the Missouri:—

“From the mouth of the Platte River the forests are narrower. The principal trees are the American and red elm, the soft maple, Canadian poplar, white and red ash; the most common undergrowth, horse-briar, fox and false grapes, red root, grey dogwood, currant, and gooseberry, with shrubs and dense rushes along the banks of the river. The same trees and shrubs grow on the numerous islands that are generally bordered with black and long-leaved willows. In the higher situations, and at the head of creeks, we meet with the black walnut and mulberry, bass-wood, nettle-wood, intermingled with the common hawthorn, prickly ash, &c. On the high grassy or rocky banks, the black and bur oaks constitute the principal growth, but occasionally intermixed with the wild cherry, red cedar, hornbeam, wild roses, and sumach. The low prairies bordering the rivers have a deep fertile soil, and abound with sedge-grasses and leguminous plants. Finally, taking a pictorial view of the country, the verdure of its hills and prairies affords a pleasing contrast with the naked sand-bars in the rivers.

“I have been thus particular in describing the vegetation of this part of the country, not only as a feature in its physical geography, but as a point of comparison with the more northerly regions which I have yet to describe.”—*Nic.*, p. 30.

The most important vegetable, native to this region, on account of its use as well as its abundance, is a grain called wild rice, by some of the Indians, *malomini*, or *menomoni*.

It is similar to the rice of the southern States, if not the same; is a principal article of food among some of the nations residing here, and gave the name to a tribe that, for the most part, subsisted on it. There are also, it is said, the wild potato, and wild onion, found here. The former, as the writer was informed by Le Claire, late interpreter to the Sac and Fox Indians, gave the name to the Wabesepinicon river: Wabe-se-pin, potato, or white potato, icon, abode, or residence. There is a piece of prairie also, some miles north of that river, called, by the French, Pomme de terre (or potato) prairie. Some of the streams are supposed to have derived their names from the wild onion. Chicago, or Chicagua, anything with a strong smell, is the name applied to this vegetable, and to the skunk. The sun-flower, the artichoke, and the resin plant, grow abundantly in places.

Mr. Doty, in a letter to Gov. Cass, says the wabesepin resembles a potato, is mealy when boiled, and grows only in wet clay ground, about one and a half feet deep. The crane potato, called sitchauc-wabesepin, is of the same kind, but inferior in quality. The Indians use these for food, as well as the menomini, and another long and slender root called wappinee. Probably it is the first of these that is referred to by Nicollet, in the following extract, as the prairie turnip:—"The future inhabitants of this region, among its most interesting specimens of vegetation, will find, as trees, the American and red elm, lime tree, bur oak, white ash, ash-leaved maple, nettle tree, large American aspen; as shrubs, the hazel, red root, peterswort, &c.; as herbs, alum-root, tufted and American vetch, wood sorrel, sedge and pasture grasses.

"The intermediate prairies are characterized by small depressions, filled with rough grasses, and bordered by the Canadian cinquefoil, the germander, southern lily, and but-

ton snake-root. Extensive beds of the Virginia strawberry are frequently met with in low places ; and in the vicinity of salinas, a species of clover called *buffalo clover*. On the arid slopes is the pink milk vetch, inhabited by millions of Spanish flies. Sandbrakes are generally full of mustard and dwarf amaranths ; whilst the stony-grassy borders are fringed with dense bushes of the mimosa tribe and long-leaved willows. Finally, all the high prairies abound with the silver-leaved *psoralia*, which is the prairie turnip of the Americans, the *pomme des prairies* of the Canadians, and furnishes an invaluable food to the Indians."

Of grasses, the growth is very luxuriant and various. Fitted for the abode of the innumerable herds of buffalo that formerly roamed over it in divided empire with the Indian, this country affords perhaps the best pasture, whether natural or artificial, on the earth. Many of the varieties of the English cultivated grasses are found here. The fox tail, the crow foot, and the oat grass are native here. On the bottoms is a very luxuriant grass, growing on a round stem or culm, eight to nine feet high, which cattle eat with avidity. There is also a sweet scented grass, having nearly the smell of savory. On all the upland prairie is a very nourishing grass, growing from two to three feet, which furnishes the winter food for cattle and horses. This grass is exceeding good, both for summer and winter food, and both for beef and butter. The latter article in the prairie country of Iowa is unusually sweet and delicious.

The buffalo and beaver, formerly abundant, at the discovery of the country, have withdrawn. The former are now west of the Missouri River. A few beaver may perhaps occasionally be found in the more remote parts of the country, in the highest latitude. The elk is yet on the border settlements in Iowa : the deer is very abundant. To the west, toward the

mountains, is a small horse which the Indians take and use under their rudely made saddles. The prairie wolf is very numerous. At about ten miles from Jackson County seat, on the travelled mail road to Dubuque, and fifteen miles from this last, the writer once passed seven of these animals in company, at another time three. The panther is occasionally seen. The lynx more frequently. Of these, the writer once saw three at a time. There are some badgers. The raccoon is very numerous ; and, next to the wolf, most destructive to the domestics of the farm-yard. Bears, and some cats are found in parts of the country. The rabbit is very abundant. Foxes do not inhabit, so far as known to the writer, any part of this country. The skunk is not often met. In grounds appropriate to their residence, the muskrat are abundant. The gopher is an animal very singular in his appearance. He is twice the size of a common rat, mouse-colored, having a large pouch on either side of the head. His feeble bark or squeal may sometimes be heard in riding along the prairie, which is very closely studded with his conical house-top, standing above the surface, much resembling ant-hills. All the varieties of squirrels inhabit here, and there is a field mouse of a larger size than the common animal of that name in the eastern part of the continent. The weasel is occasionally found, and there is a small animal, striped like the little striped squirrel, living in the prairie, having a long body and tail and very short legs, which is commonly known there as the prairie squirrel, though I think he is of the weasel tribe, having more resemblance to this animal in form than to the squirrel. This creature and the gopher are very destructive to the corn-fields, and compel the farmer frequently to plant his corn twice and three times.

The wild turkey is found in great numbers on the wooded bottom lands ; the prairie hen is frequently seen by hundreds

in the prairie. The hawk, buzzard, eagle, owl, and a small paroquet, and several varieties of woodpeckers, are met occasionally. The woodcock, snipe, and quail, are abundant. There is a very peculiar bird inhabiting the wet prairies and marshes, about the size of the prairie hen, and having a close resemblance in color and shape; the principal difference being in a longer neck, and a bill of very peculiar construction. It is some nine or ten inches in length and bent over at the end like a sickle, the hooked part being from one to two inches long. The swan and pelican are seen occasionally on the Mississippi, in the latitude of the lower rapids. Farther north and west they are believed to be more abundant. To one of the lakes in the north-west the Indians have given an appellation which signifies "the place where the pelicans nestle." Geese and ducks are very abundant on some of the water-courses; and occasionally a gull, similar to the saltwater-gull, is seen. The small, slender-legged bird, with a shrill, mournful note, which is found running about the shores and marshes near the sea, in the east, commonly called the peewit, is here. Robins, sparrows, swallows, and the other small birds common to the east, are also inhabitants of this region.

Of reptiles, the Upper Mississippi cannot be said to be very prolific; though in some localities this division of animated nature is sufficiently represented. The varieties are, the great yellow rattlesnake, the prairie rattlesnake (called by the Indians massasauga, great adder), the copperhead, the bull snake, the milk snake, the black snake, the moccasin; and in the rivers the water-moccasin, with a number of small adders. There is one of this tribe called the death-adder, said to be as fatal as the copperhead or rattlesnake. The writer saw one specimen of an unknown and very peculiar kind of snake. It was in the road about one mile back from the river, at the foot of the lower rapids. Its length was ap-

parently not over fifteen inches, its diameter one and a quarter or one and a half inches, square, not round, its color a dull yellow or buff, with one or two darker but faint lines drawn upon it. At the distance of about two or three inches from the extreme point of the tail the square shape of the body abruptly terminated, like a stick notched, and cut down so as to describe a circle on the end of the parallelogram, and from thence it was a regular cone to the point. Having sat upon my horse and viewed it for some time, I was satisfied that its motion and mode of attack must be very different from the common varieties of the snake; as, though it wriggled like the worm, it made no perceptible advance, and I inferred, from its lack of longitude, that it could not make much progress in the common way. Upon reference to Shaw, Dr. Goldsmith, Fleming, and other writers on Zoology, I can find no description of this very singular animal. Dr. Morse, in his Geography, does not notice it.

Beside the coluber, and the toad, and frog, and turtle, and the common worms, reptiles are not numerous.

The people inhabiting this country are the Menominites, or Malominis, the Potawatomes, the Winnebagoes, Chippewas, Dahcotahs (called by the French Sioux), and Sacs and Foxes: this last band is always called, by their own people, Musk-wáka. The Sacs call themselves Sáki. Beside these there are several thousand eastern Indians removed from New York, who inhabit the northeastern part of Wisconsin, near Lake Michigan.

RIVERS.

The Mississippi and Missouri, the principal rivers of this country, are well known. The Missouri, rising in a mountain region, flows with a rapid current, about four miles an

hour, is very turbid and muddy, and is subject to a great rise. Three times, since the country was known to the whites, it has risen thirty or forty feet above the usual high-water mark. The last rise was in the summer of 1844, and was very disastrous, overwhelming the whole bottom country between the bluffs. The Mississippi, rising from lakes in the midst of a champaign, and flowing through a similar region, and over a wide bed, from bluff to bluff, has a slower current, generally from two to two and a half miles an hour, is a clear, limpid stream, and is rarely known to rise more than ten feet. In the spring of 1844, however, it had a rise of fifteen feet or more. The Missi-sippi, or, according to other Indian dialects, Massi-sepo (so the Musquakas speak it), great river, is in length, as given by Mr. Nicollet, the latest and most accurate authority, in his report to Congress (p. 125), 2,896 miles, reckoning to its "utmost sources at the summit of the *hauteurs de terre*, or dividing ridge between the Mississippi and the Red River of the North." From this point to the mouth of Leech Lake River is 221 miles; to Wanomon or Vermillion River, 248; to the head of the Kabikons, or Little Falls, 269; to the mouth of Kagi-wigwan (Crow-wing) River, 515; to the Karishon (Crow) River, 667; to the mouth of St. Peter's, 704; St. Croix, 746; upper end of Lake Pepin, 781; Chippeway River, 810; Black River, 861; Upper Iowa, 918; Wisconsin, 970; head of the Upper Rapids (Rock River Rapids), 1159; head of the Lower Rapids (Des Moines), 1287; Illinois River, 1470; Ohio River, 1680; from thence to the Gulf of Mexico, 1216. Rock River comes into the Mississippi on the east, about nineteen miles below the head of the Upper Rapids. The Lower Iowa River enters on the west, about forty-five miles below Rock River; and the Moingonan, or Des Moines, about fifteen miles below the head of the Lower Rapids. These rapids extend about

eleven miles upon the river ; the upper rapids are about fifteen miles in length. Mr. Schoolcraft, who considered, as did Nicollet, the Lake Itasca to be the source, computed the whole length of the river at 3,160 miles, or 264 more than Nicollet. This, probably, was occasioned by the addition of estimates not very accurate from point to point upon the river, founded upon the reckoning of the boatmen.

Major Long, who measured the height of the falls of St. Anthony with a plumb-line, in 1817, states it to be sixteen and a half feet. In this he agrees with Pike, who visited it twelve years before him. Carver called it thirty feet. Henepin, the first European who saw and named it, in 1680, says it is fifty or sixty feet high. For reasons hereafter mentioned, in the historical part of these notes, full reliance cannot be placed on Henepin. It may be, however, that the ponderous body of water is gradually wearing away the stone which makes the bed of the river before it falls, and that thus the height is constantly diminishing ; or, by the falling of the stone, and the consequent receding of the fall, the same effect might be produced. It is stated, by Nicollet, I think, that in a half mile the whole fall is seventy-five feet.

In relation to the recession of the falls, and the whole descent of the water, Mr. Keating says :—" The river (Mississippi) runs upon a bed of sandy alluvion, resulting from the destruction of the bluffs, but in many places the rock is laid bare. These observations upon the geology of the bluff upon which the fort is erected correspond with those made at the Falls of St. Anthony, with this exception, that, at the latter place, our observations are limited to the three superior strata, viz : the slaty limestone, with organic remains ; the blue limestone, destitute of these ; and the sandstone, with a loose texture. The falls are occasioned by the fissures which occur in the superior limestone, and which allow the water to

penetrate through this bed to the sandstone, which, being of a loose texture, is soon washed away ; in this manner, thick plates of limestone are left unsupported, and soon fall by their own gravity. This process is constantly causing the fall to recede towards its source. What time has been required, what lapse of centuries has been consumed, in bringing the falls to their present situation, it is not in the power of man to decide ; but we may well see that it must have been immense. The difference of level at the head of the fall and the level of the river at the fort being estimated at about one hundred feet, and the strata running in a horizontal position, we can readily account for the additional strata observed under the sandstone at the fort, and which are concealed at the falls." [Long's 2d Exped., v. i., p. 309.]

By the Sioux these falls are called Rara, from Irara, to laugh (or, perhaps, Irara, which, quickly spoken, would sound Rara). The Chippewas call them Kakabikah, severed rock.

Major Long tells a romantic story in connection with these falls. It is thus :—An Indian of the Dakota nation had united himself in his youth to a female called Ampato Sapa, the Dark Day, a name which, if given at her birth, and not afterward bestowed in allusion to her unfortunate end, would seem to show that these people possess the power of divination. They lived happily together many years. Two children were the fruit of their union. The man, having acquired renown as a hunter, aspired to be elected a chief. To increase his dignity and importance, and to strengthen his influence, he resolved to add another wife to his household, and fixed his choice on the daughter of a man of influence in the tribe. When he made known his determination to his wife, she endeavored to dissuade him, by reminding him of their long-cherished love, and the happiness they had

enjoyed together. Finding no arguments available, and, in fact, that he had already executed his purpose of a second marriage, she observed her opportunity, launched her light bark canoe, and placing her children in it, pushed off into the stream above the fall. Her death song was heard, clear and shrill, by her friends upon the banks of the river. She recited, with a mournful voice, the pleasure she had enjoyed when the undivided object of her husband's affection. As she fell faster and faster down the current, her voice became lost in the sound of the cataract. Her boat was borne to the edge of the cascade, was seen for a moment in the spray and mist that hovered over the water, and disappeared, to be seen no more. The Indians say that, often, in the morning, a voice is heard singing a mournful requiem, the burden of which is the inconstancy of her husband. And some assert that the spirit of Ampato Sapa has been seen wandering about the place with her children in her bosom.

For a description of the head-waters and superior course of the Mississippi, I quote Mr. Nicollet, the most recent, the most accurate, the most lively, and the most graphic description given of this stream.

"The Mississippi holds its own from its very origin; for it is not necessary to suppose, as has been done, that Lake Itasca may be supplied with invisible sources, to justify the character of a remarkable stream, which it assumes at its issue from this lake. There are five creeks that fall into it, formed by innumerable streamlets oozing from the clay beds at the bases of the hills, that consist of an accumulation of sand, gravel, and clay, intermixed with erratic fragments, being a more prominent portion of the great erratic deposit previously described, and which here is known by the name of *hauteurs des terres*—heights of land.

"These elevations are commonly flat at top, varying in

height from 85 to 100 feet above the level of the surrounding waters. They are covered with thick forests, in which the coniferous plants predominate. South of Itasca Lake they form a semicircular region with a boggy bottom, extending to the southwest a distance of several miles; thence these hauteurs des terres ascend to the northwest and north, and then stretching to the northeast and east, through the zone between 47° and 48° of latitude, make the dividing ridge between the waters that empty into Hudson Bay and those which discharge themselves into the Gulf of Mexico.

"The waters supplied by the north flank of these heights of land, still on the south side of Lake Itasca, give origin to the five creeks of which I have spoken above. These are the waters which I consider to be the utmost sources of the Mississippi. Those that flow from the southern side of the same heights, and empty themselves into Elbow Lake, are the utmost sources of the Red River of the North, so that the most remote feeders of Hudson Bay and the Gulf of Mexico are closely approximated to each other."—Nic. Rep., p. 57, et seq.

The principal creek of the five above-mentioned feeders of Lake Itasca comes into the east bay of the lake, and is from fifteen to twenty feet wide, and, at the time of Nicollet's visit, two or three feet deep. This he considers the infant Mississippi. Mr. Nicollet went up this stream three or four miles, and thus describes it:—

"As a further description of these head-waters, I may add that they unite at a small distance from the hills whence they originate, and form a small lake, from which the Mississippi flows with a breadth of a foot and a half, and a depth of one foot. At no great distance, however, this rivulet, uniting itself with other streamlets coming from other directions, supplies a second minor lake, the waters of which have already

acquired a temperature of 48° . From this lake issues a rivulet, necessarily of increased importance—a cradled Hercules, giving promise of the strength of his maturity; for its velocity has increased; it transports the smaller branches of trees; it begins to form sand-bars; its bends are more decided, until it subsides again into the basin of a third lake, somewhat larger than the two preceding. Having thus acquired renewed vigor, and tried its consequence upon an additional length of two or three miles, it finally empties into Itasca lake, which is the principal reservoir of all the sources to which it owes all its subsequent majesty.”—Nic. Rep., p. 58.

“For the first twenty-five or thirty miles the bed of the river contracts or dilates, according to the character of the shores. Its navigation is greatly impeded by erratic rocks, trunks of fallen and decayed trees, as well as impending branches of living ones, and rapids, which, in proportion to the changes of level in the bed of the river, carried along our frail canoe with the rapidity of an arrow, or left us, when wanting, in perfect repose. I may remark here, that, on this river, like all those of this region of country, where, on the narrowing of the valley, there grows nothing but willows and aquatic plants on the shores, with a fine sand at bottom, its bed is peopled with innumerable shells, especially *unios* and *anodonta*. So far, I saw not a solitary fish.”—Nic. Rep., p. 60.

At fifty miles below Lake Itasca the river acquires a greatly-increased width. I give again the words of Mr. Nicollet:—

“At this stage of its progress, the Mississippi river is wide, winding itself in large folds, as if to take masterly possession of the country; whilst its waters are enlivened by innumerable flocks of wild fowl. Then comes another contraction of the river, which soon opens again, and extends itself to

Pemidji-gomag, or *Pemidji Lake*, sometimes called *Lake Travers*. So far, the Mississippi has received the contribution of ten rivers ; its wide and flattened bed, completely covered by water, presents a lake (or rather pool) from forty to fifty miles square, clogged up with aquatic plants, with intermediary spaces of clear water, looking like channels ; but among which it is difficult to discover the true course of the river, for, at certain seasons of the year, the whole is nothing more than a marshy prairie.

“*Pemidji Lake* has not received from geographers the attention that it merits ; so that I cannot resist the temptation of describing the impression it made upon me. It is a magnificent sheet of water, from ten to twelve miles long, with a breadth of from four to five, perfectly clear, and without islands ; the eye having a free command over gently-swelling hills, receding, and thickly wooded ; and it is said that no other river but the Mississippi empties into it, save an obscure rivulet at its northern extremity. I must confess that, in crossing it, I felt melancholy that, even with my artificial optics, I could not descry any evidences of civilisation—no cottage of the agriculturist ; no meadows, no herds, nor any of those cultivated fields whose mellow shades contrast so gracefully with the foliage of the forest. The piercing, solitary cry of the Northern diver—the precursor, according to the Indian tradition, of high winds and hurricanes—was the only evidence of living nature that presented itself.”—Nic., pp. 60, 61.

From Sandy Lake, in about latitude $46^{\circ} 45'$, to Crow-wing River, a distance of about one hundred and fifty miles, the Mississippi may be navigated by small steamboats. In high stages of water, they may pass over the intervening rapids to the Kabikons, or Little Falls, one hundred miles further. Mr. Nicollet further says :—

“Over the whole route which I traversed after leaving Crow-wing River, the country has a different aspect from that which the banks of the Mississippi above the Falls of St. Anthony present. The forests are denser and more varied ; the soil, which is alternately sandy, gravelly, clayey, and loamy, is, generally speaking, lighter, excepting on the shores of some of the larger lakes. The uplands are covered with white and yellow pines, spruce and birch ; and the wet, low lands, by the American larch and the willow. On the slopes of sandy hills, the American aspen, the canoe-birch, with a species of birch of dwarfish growth, the alder, and wild rose, extend to the very margin of the river. On the borders of the larger lakes, where the soil is generally better, we find the sugar-maple, the black and bur oaks (also named over-cup white oak, but differing from the white oak), the elm, ash, lime-tree, &c. Generally speaking, however, this wood-land does not extend back farther than a mile from the lakes. The white cedar, the hemlock, spruce pine, and fir, are occasionally found ; but the red cedar is scarce throughout this region, and none, perhaps, are to be seen but on islands of those lakes called by the Indians *Red Cedar Lakes*. The shrubbery consists principally of the wild rose, hawthorn, and wild plum ; and raspberries, blackberries, strawberries, and cranberries, are abundant.

“The aspect of the country is generally varied by hills, dales, copses, small prairies, and a great number of lakes ; the whole of which I do not pretend to have laid down on my map. The natural beauties of the country are, however, impressed with a character of sternness and melancholy ; the silence and solitude of which are interrupted or revived only by the flocks of water-fowl that congregate about its waters, to nestle amidst and fatten upon the wild rice. The naturalist, however, has still an endless field of observation in the insect

world, for everywhere life manifests itself in some form or other. It is, indeed, remarkable, that the more we advance to the north (to within a certain extent, nevertheless), the more the mosquito appears to be abundant, as every voyageur knows by sad experience.

“The lakes to which I have just alluded are distributed in separate groups, or are arranged in prolonged chains along the rivers, and not unfrequently attached to each other by gentle rapids. It has seemed to me that they diminish in extent on both sides of the Mississippi, as we proceed southwardly, as far as 43° of north latitude; and this observation extends to the Arctic Region, commencing at Bear's Lake, or Slave Lake, Winnipeg Lake, &c. It may be further remarked, that the basins of these lakes have a sufficient depth to leave no doubt that they will remain characteristic features of the country for a long time to come. Several species of fish abound in them. The white fish (*corregonus albus*) is found in all the deep lakes west of the Mississippi; and, indeed, from Lake Erie to the Polar Sea. That which is taken in Leech Lake, is said, by amateurs, to be more highly flavored than even that of Lake Superior, and weighs from three to ten pounds. There is another species of this white fish, called, by the Indians, *tuliby*, or *ottuniby* (the *corregonus artedi*), which resembles it, but is much less esteemed. Both species furnish a wholesome and palatable food. Among the other species of fish that inhabit these waters, are the *mashkinonge*, or *mashkilonge*; the pike, or jack-fish; the pickerel, or gilt carp; the sucker, or true carp; the perch; a species of trout, called, by the Chippeways, *namogus*, &c., &c. These lakes, which are somewhat deep, swarm with leeches; and, among the amphibious reptiles, there are several species of terrapin and turtle, of which Mr. Say has

described three of each kind in the appendix to the Second Expedition of Major Long.

"The portage between these lakes and rivers is effected by means of intricate paths, the key to which it would be well to have, as, without it, an Indian war in this quarter might present still more difficulties than those experienced in Florida. For this reason, I have been particularly careful in laying these portages down on the map, which I could not have done had I adopted a smaller scale. It must be borne in mind, that, in this region, during six months of the year, no use can be made of either horses or carriages; it is absolutely necessary to have recourse to bark canoes. Any one consulting the map to study the portages, will soon perceive that an enemy, after crossing one of the larger lakes, may make his escape in almost all directions. In this respect, its utility becomes, I think, obvious, not only to travellers, but to the civil and military department of the national administration."—Nic., pp. 64, 65.

"St. Peter's is in my opinion the finest site on the Mississippi river; the natural beauty of its environs adding to its importance and grandeur. Upon reaching this place the traveller is already premonished of the magnificent scenery which he will enjoy in ascending the river through its long, narrow, and deep valley. At the confluence of the St. Peter's and the Mississippi, there is an extensive and fertile plateau reaching far to the west, and presenting to the delighted gaze a level country, interrupted by moderate undulations of the surface, and beautified by intervening prairies, tracts of woodland, and lakes. Fort Snelling is located on the rocky point at this confluence of the two rivers, the sight of which inspires a sentiment of self-protection in the civilized man thus confronted with the wilderness. Looking to the right of the fort, we behold a continuation of the valley of the Mississippi,

whilst to the left begins that of the St. Peter's. The former has a character of sternness, produced by the denuded and abrupt escarpments of its banks, the wear of which forms rude taluses at their bases. The latter is more graceful, having gently sloping borders, divided into natural terraces, covered by a luxuriant, grassy sward. Three miles from Fort Snelling, and on the right bank of the Mississippi, there is a very pretty cascade. Four miles further, we reach the celebrated Falls of St. Anthony, which, examined in detail, with the noisy boiling of its waters, rebounding in jets from the accumulated debris at its foot, its ascending vapors, and the long and verdant island that separates the two portions of the falls, with the solitary rocky island that stands in front, altogether form a grand and imposing spectacle.

"From St. Anthony's Falls may be visited the Lake of the Isles, Lake Calhoun, Lake Harriet, and other lakes. Then, crossing the St. Peter's near its mouth, the traveller ascends the Pilot Knob, from the summit of which he enjoys a magnificent view, embracing the whole surrounding horizon; and if he will conclude his excursion by going to two natural grottoes in the vicinity, should his journey have commenced under the auspices of a bright rising sun, he may flatter himself that it has been most actively and pleasurably performed.

"The name of St. Peter's (the St. Pierre of the French), it appears, has been immemorially given to the spot or landing at the mouth of the river St. Peter's; but whence the name is not known. Father Hennepin, who was the first to visit the Falls of St. Anthony, in 1680, makes no mention of this river; but his book is written very confusedly, and, as he gives no details of his route, perhaps had no occasion to visit it, and was also molested by the Sioux, the omission is explicable. On the other hand, Lesueur, in the journal of

his third journey, in 1700, names the St. Peter's as familiarly known and acknowledged by traders. As for my part, I have no hesitation in assigning its origin to a Canadian by the name of *De St. Pierre*, who resided for a long time thereabouts. Carver, in referring to the supposed fortifications which he visited below Lake Pepin, mentions a Mr. De St. Pierre; but this was sixty-four years after the travels of Lesueur. However, waiving any further inquiry into the origin of this name, it is desirable that it should not be changed, because it is an important link in the history of the geographical discoveries made in this region, as well as a constant point of reference by travellers over it; so that any change would throw additional obscurity upon the early history of the country.

"The name which the Sioux give to the St. Peter's River is *Mini-sotah*; and to St. Peter's as a station, *Mdote-mini-sotah*. The adjective *sotah* is of difficult translation. The Canadians translate it by a pretty equivalent French word, *brouille*—perhaps most properly rendered into English by *blear*; as, for instance, *mini-sotah*, blear water, or the entrance of the blear water. I have entered upon this explanation because the word *sotah* really means neither clear nor turbid, as some authors have asserted; its true meaning being found in the Sioux expression, *ishta sotah*, blear eyed. After the same manner they call the Falls of St. Anthony *rara*, from *Irara*, to laugh, descriptive of the imitative sound they are supposed to produce. The Chippeways are more accurate; by them the Falls are called *Kakabikah*, or severed rock; and the St. Peter's River *Ashkibogi sibi*, the Green Leaf River."—Nic., pp. 68, 69.

"From actual measurements made by Mr. H. Sibley and myself, the width of the St. Peter's at the crossing-place, above its confluence, is 320 feet; that of the Mississippi, below Fort Snelling, and outside of the gorge whence it issues,

is 576 feet. The intervening space between these two measured spots is the rock point on which the fort stands, and a grassy bottom, the whole measuring 1263 feet. The mean height of the plain supporting Fort Snelling and the Indian Agency is 106 feet above the common low water of the two rivers, and the height of the Pilot Knob above the same level, 262 feet."—*Ib.*, p. 67, et seq.

Lake Pepin, about 110 miles below St. Peter's, excels all other points on the Mississippi, below St. Anthony's, in the beauty and majesty of its scenery. It is an enlargement of the Mississippi, in some places three miles wide, and averaging about two and a half, filling the whole space from bluff to bluff, except at two points, where a small meadow appears, and extending in length twenty-one miles upon the river. Its greatest width is at the southern extremity. The rapid current of the river here settles into an almost stagnant pool, and the lake presents a smooth and nearly motionless expanse of water without a single island, though the river, in its whole course, has a great many, dotting and diversifying the water scenery at short distances. The majestic bluffs of limestone that wall in the lake, stretch with more regularity, and rise to a height more nearly uniform than in other parts of the river. The Lake is at times considered dangerous when ruffled by storms. "Le lac est petit, mais il est malin," said Major Long's interpreter. On the eastern bank, about midway on the Lake, the rocky bluff rises to a height of 450 feet, the superior 150 feet being perpendicular, and the remaining portion below very abrupt. It forms a point projecting into the Lake, with a small estuary on either side. This point has received the name of the Maiden's Rock, from an incident which is related by Major Long.

In the band of Wapasha inhabiting the village of Keoxa was a young Indian maid called Winona, "the first-born."

She had conceived an attachment for a young hunter, which was reciprocated, and they had frequently met, and agreed upon an union. Her family favored the advances of a warrior of distinction, and repelled those of her chosen lover. Her expostulations were unheeded. Her friends drove away the hunter, fixed a day for the nuptials with the warrior, and commanded her to comply. Winona had, in an uncommon degree, the affection of her brothers, and they besought for persuasive rather than compulsory means toward her. A party was formed to Lake Pepin, to obtain the blue pigment used by the Indians. At this time the warrior, who was present, encouraged by her friends, again urged his addresses, and was again repelled. Vexed by her obstinacy, her parents threatened her, to compel obedience. "Well," said Winona, "you will drive me to despair. I have told you that I cannot love him, and that I wish to live a maiden. You say that you love me, and yet you have driven away the man of my choice. Well! let it be so. But soon you will not have a daughter and sister to torment with your false professions of affection." She withdrew from the company, and while they were preparing the feast, wended her way slowly to the top of the bluff. When at the summit, she called to her friends, upbraided them for their cruelty, and began to sing her death-song. Her friends rushed toward the base of the bluff, entreating her to desist, while others madly ran up the hill to prevent her fatal design. But she was resolved, and as she finished her song, threw herself from the precipice, and fell, a corpse, at the feet of her distressed friends.

The Upper Rapids of the river (in speaking of that portion of it below St. Anthony's), commonly called Rock River Rapids, extend in length about fifteen miles, upward from the foot of Rock Island, which is four miles above the mouth of Rock River. The whole fall in this distance is about twenty-

six feet. It consists of several chains of ledges, to each of which the navigators of the river have given distinct names. The depth of water in some places, at the lowest stages, does not exceed three feet. The current is so rapid at one point near the head of Rock Island, and at one or two other points, that a boat, in ascending, cannot be perceived to make any progress.

The Des Moines Rapids begin at three or four miles above the mouth of Des Moines River, and extend upward about eleven miles. The whole fall is about twenty-two feet. The descent is more regular, and consequently the current more uniform than on the Upper Rapids. Boats of moderate burden pass over both of these rapids at all stages; and at some times the river may be passed by any boats to St. Anthony's Falls. The national government have long had it in contemplation to improve the navigation over these rapids; but it can never be done properly, until the system of log-rolling is laid aside, and the sectional jealousy that withholds the needful appropriation, doling out a scanty modicum at a time, and riding upon it a hundred other appropriations for as many different objects.

The Upper Rapids may be improved at a very trifling cost, by letting in Rock River through the Marais D'Osier, or Willow Swamp (sometimes called Marais D'Ogee, and Meredosia), which extends from that river to the Mississippi, and through which, at high stages, the waters of the two rivers actually mingle; or, by bringing the same stream upon the Mississippi about ten miles above its present embouchure, over an intervening low and level tract of only three miles in width.

From Gen. Victor Collot, former Governor of Gaudeloupe, who travelled in the United States in 1798, the following description of this river is taken:

"The province of the Illinois is, perhaps, the only spot respecting which travellers have given no exaggerated account. It is superior to any description which has been made, for local beauty, fertility, climate, and the means of every kind which nature has lavished upon it for the facility of commerce.

"This country is a delightful valley where winds one of the most majestic rivers on the globe, and which, after receiving the vast Missouri, is still augmented by an infinite number of smaller rivers and creeks, all navigable and fitted for the construction of mills and machinery of almost every kind.

"This valley is full of small lakes and villages, and interspersed with woods and natural meadows, strewed with medicinal and odoriferous plants. Across these meadows flow numerous rivulets, sometimes murmuring beneath the flowers, and sometimes displaying their silver beds and their transparent waters, pure as the air which is breathed amidst those romantic spots. On each side of those vast meadows, which are level as the surface of the calm ocean, rise lofty and venerable forests, which serve as boundaries, while their thick and mysterious shades fill the mind with reverential awe and enthusiastic contemplation."

In the foregoing description, Gen. Collot has reference to the river bottom only, on the Mississippi between the bluffs.

"This valley," he says, "is bounded on the right and left by two small chains of mountains running parallel with the banks of the river, but never more distant than four or five miles.

"The chain on the east begins to be perceived from the mouth of the river Kaskaskias, and runs in the same direction, as far as the Prairie Du Chien, situated 240 leagues higher.

"These small chains rise commonly 150, and sometimes 200 feet above the level of the lands which separate them from the waters of the river. These masses of rock are composed sometimes of grey stone, flint with which the Indians tip their arrows, or millstone, but most frequently of limestone.

"The lands which run along between these chains and the bed of the river, form, as I have already observed, vast meadows intersected with small woods; the whole of these lands are the product of successive deposits, occasioned by the overflowings of the river. Trees half burnt are often found in digging, together with pieces of earthen and iron utensils. The whole is a bed of sand, the surface of which is covered with a vegetable layer four or five feet in thickness."—*Collot*, p. 232, et seq.

One or two extracts from Nicollet will close that part of the notes having relation to the physical geography and scenic aspect of the giant river.

"The whole country embraced by the Lower St. Peter's and the Undine Region [or Mankato Valley], exceeds any land of the Mississippi above Wisconsin River, as well in the quality and quantity of its timber as the fertility of its soil. The forests of the valley on the right bank are connected by groves and small wooded streams of the adjoining prairies with the forest called Bois-francs; and they extend so far southwest, as to include the lands of the upper waters of the Mankato River.

"The forest trees, as reported to me by Mr. Geyer, are chiefly soft maple, American and red elm, black walnut, the nettle tree, bass wood, red and white ash; the undergrowth, the common hawthorn, prickly ash, high cranberry, red root, grey dogwood, fox grapes, horse briar, and moonseed. Among the herbs, are the wild and bristly sarsaparilla, Indian

turnip, the gay orchis, and others ; rushes and the flowering ferns are abundant along the low banks of the rivers. The valley prairies are rich in pasture grasses and leguminous and orchideous plants, such as the yellow ladies' slipper, American and tufted vetch, and others. The lowest parts near the borders of the woods, and those subject to inundations, are filled with the high weeds common to such places—as the ragged cup, tall thistle, great bitter-weed, the tuberous sunflower, and others.

“Swamps are frequent, and some of them contain extensive tracts of tamarack pines. Cedars grow intermixed with red birch on the rocky declivities of the Lower Mankato River. Red and bur oak, with hazel, red root, peterswort, and the wild rose, are the trees and shrubs of the uplands. There are, besides, thickets of poplar-birch, that are frequent in the elevated prairies near the river. The prairies are very luxuriant, and generally somewhat level and depressed ; the gum plant and button snakeroot are their most abundant and conspicuous herbs.

“Along the Mississippi, a length of 180 miles, from St. Peter's to Crow-wing River, the valley is wide, with river banks of moderate elevation, affording beautiful sites, that contrast remarkably with the bold escarpments exhibited below the Falls of St. Anthony. In this ascent of the river, which is full of rapids, it is necessary to have recourse to the pole or the tow-line ; and, generally, following the left bank, under good guidance, and with sufficient hands to stem the current, portages may be avoided. This left bank presents almost a continued level of from ten to twenty feet in elevation, forming a retreating succession of terraces that are delightful to the view. The superincumbent soil is composed mainly of sand, gravel, and clay, intermixed with erratic blocks. The sylva consists of white and black oak, white

and blue ash, red elm, two or three species of maple, the lime tree, birch, a few hickories and walnuts. The western shore is more generally interspersed with swamps and woodlands, well set with pines, birch, and sometimes with extensive camps of the sugar-maple.”—(*Nic.*, p. 54.)

“The first steamboat arrived at St. Louis in 1819. Since that time the Upper Mississippi is covered with these boats; and the number of arrivals yearly at Galena and Dubuque is upwards of 1000. A few boats go above. In the summer of 1844, two boats were used to run regularly from Galena to St. Peter’s. No summer has passed in the last five years without the passage of some boats up the river to that point with parties of pleasure, to enjoy the cool prairie breezes and rich scenery of that upper region.

Beside the steamboats, there are keel boats used for conveying produce and merchandise; flat boats, and dug outs or canoes, rudely made of logs. Occasionally a Mackinac boat, sloop-rigged, is seen there, brought over from the lake by the Fox and Wisconsin rivers. The obstructions which are so annoying to the navigator below the mouth of the Missouri, known under the name of planters, sawyers, snags and rafts, are but rarely found above the confluence of the two streams, in the Mississippi.

The river has an annual rise, from April to June, of some six to ten feet; and there is sometimes a second rise about September. The usual velocity of the current is about two miles an hour. The water is very clear.

MISSOURI RIVER.—Of the Missouri River much less is known than of the Mississippi, and it is also at this time much less an object of interest. The current of the Missouri is said to be about four miles an hour, or double that of the Mississippi. Its water is turbid, and in these two par-

ticalars it greatly differs from the other river, with clear waters and a moderate current. The fall of the Mississippi from St. Peter's, and that of the Missouri from Pierre Chouteau, to the confluence of the two rivers, are in the ratio of 45 to 85, according to Nicollet, and therefore the average rapidity of the Missouri is nearly twice that of the Mississippi.* The great rapidity of current in the Missouri rendering that river difficult of navigation, even by the power of steam, in the upward voyage, is not the only obstacle, however, to the passage of boats upon it. Its velocity and force constantly bring along and heap up sand bars, a characteristic of nearly all the western rivers, except the Des Moines and Rock Rivers, which have rocky beds. Beside the accumulating and shifting of sands, the same cause fills the river with planters, snags, and sawyers, which are all the same thing, that is, drift wood partly buried in the sand so as to hold in position, while projecting to the surface it presents a point upon which the boat strikes, and is wrecked. The different names given to this kind of obstruction have reference merely to the position in which they become fixed.

The Missouri in the lower part of its course is very turbid, bringing down a great quantity of mud with its waters. This character, it has been said, it loses above the Platte, 600 miles from its mouth. The difference in the descent of its current above that point, as given by Nicollet, renders the

	miles fr. m.	alt.		alt. at m.
* F. P. Chouteau	1256	1456	—	388 = 1068
St. Peter's	786	744	—	388 = 356

From these measurements it appears the Missouri falls 1068 feet in 1256 miles, or over 80 feet in 100 miles, and the Mississippi 356 feet in 786 miles, or over 40 feet in 100 miles, or $5\frac{1}{4}$ ins. nearly in a mile. The fall of the Missouri is, however, unequal: in the upper 650 miles, starting from Fort Pierre, the descent is 484 feet, a little over 8 inches to the mile: in the remaining 600, to the mouth, it is 584 or 12 inches nearly to a mile.

assertion very probable. Above Yellow Stone it has a fall of 362 feet in 17 miles : the upper fall is 90 feet. The tributaries are almost innumerable. The most considerable in length and width is the Platte, but it is too shallow for navigation.

The bottoms of this river are higher than the Mississippi, and rather narrower.

The distance from the mouth of the Missouri to the mouth of the Osage is 135 miles : to Kansas River 382—Nishnabotona 540—Platte or Nebraska 618—Council Bluffs 676—Sioux River about 860—James River about 950—Poncah or Niobrarah River 1018—Fort Pierre Chouteau 1256. These distances, given by Nicollet (except the Sioux and James), are the results of measurements made by him. To the Yellow Stone the distance is said by Flint to be 1880 miles, the whole of which distance is navigable ; from the mouth to the Gulf of Mexico is 1400, making in the whole a navigation of about 3300 miles from the Yellow Stone to the Gulf.

“On reaching the Coteau du Missouri, there are no further apparent traces of the cretaceous formation. It is a rolling prairie, the soil partly covered by a short, sweet-scented, and grateful verdure. An inspection of the gulleys shows that the basis of this soil is the erratic deposit previously described. The siliceous particles of the soil are blackened by the smoke of the vernal and autumnal fires of the prairies ; and, as the growth is too scant to prevent the dust from being raised by the almost incessant winds that blow over them, the traveller is very much inconvenienced. There are no springs to quench the thirst ; and it is only at wide distances apart that small pools are met with, bordered by aquatic plants, towards which the experience of his guide is necessary to bring him to his bivouac,

where he must needs have recourse to the dried dung of the Buffalo for fuel. It was in the hope of extricating ourselves from difficulties of this kind, that we made an examination of the forks of the East Medicine River, which empties into the Missouri about fifteen miles below Fort Pierre.

“This last-mentioned river derives its name from a beautiful hill on its right bank, called by the Sioux *Pahah-wakan*—translated by the voyageurs, ‘Butte de Medicine,’ and, in English, Medicine hillock, or knoll. It is to be remarked, in fact, of the prairies of this region, that they present such low insulated hillocks, to which the Sioux apply the somewhat generic name of *ré* or *pahah*, according as they are more or less elevated above the surrounding plain. The affix, *wakan*, indicates that the locality is to them peculiarly remarkable, or even sacred, and a spot which they select in preference for some of their ceremonies.”—*Nic.*, p. 44.

The secondary rivers of this region are the St. Peters, St. Croix, Chippewa, Wisconsin, Rock, Moingonan or Des Moines, and Illinois falling into the Mississippi, and Tchan-sansan or James, and Tchankasdata or Sioux, falling into the Missouri. The Fox River or Outagami, falling into Lake Michigan, is also to be placed in this class. Other streams that are of some importance are the Crow Wing or Kagiwigwan, Karishon or Crow, Iskodo Wabo or Rum, or Spirit (the meaning, I think, is White Fire Water), Sappah or Black River, Hokah or Root, Upper Iowa, Penaca or Turkey, Maququeta or Bear, Wabesepinecon or White Potato abode, as the interpreter told me* (or rather, I think,

* Mr. Leclair, former interpreter of the Sacs and Foxes, gave me the above definition of the name of this river: Wabe, white; pin, potato; icon or nicon, abode. It may be so: and the third syllable, *se*, only an expletive. But Wabe-sepo, or sipi, is white river. This tribe use the

White River abode or place of council), Wabe (white) sippi (river) neon (abode or council place), Iowa or Anketosakesha (horse), Checaqua, and Salt River, all these fall into the Mississippi. The Blue Earth, or Mankato, falling into St. Peter's; the Chariton, the Grand River, Little Platte, Nishnabotona, Inyan Yankey, or Little Sioux, flowing into the Missouri; Shayan Oju, flowing into Red; and a number, almost endless, of smaller rivers.

ST. PETER'S RIVER, called by the Sioux Mini-sotah (blear water), and by the Chippeways Ashkibogi (green leaf), rises in a region of lakes at the head of the Coteau des Prairies, and running southeast soon expands into the Big Stone Lake, and farther on, after receiving two considerable streams, the Izuzah and Tipsinah, again forms a small lake (called Qui parle, or Echo Lake), below which the volume of water is again much increased by the addition of other branches, the Intpah and the Manya Wakan, and farther down by the Pej-uta Zizi, or Yellow Medicine; below which are a series of rapids and falls for thirty or forty miles to the Tchanshayapi or Red Wood, another branch, which, starting in immediate contiguity with the sources of Moingonan, and seeking St. Peter's by a not very winding course, falls into it on the right in about $44^{\circ} 35' N$. Below this the river is navigable to its mouth, about 250 miles. In this part of its course it receives the Waraju, Little Waraju, and Mankato, or Blue Earth, on its right bank, and immediately turning, runs in a right angle to its former course, and receiving a great number of small streams on both sides, and on its left the Witahantu, of larger

termination nica, nicon or icon, to express something more than abode or residence. Thus they call the city of Washington, Washitonica or Wash-itonicon. It probably means place of council, or perhaps abode of the Chief. Mr. Doty gives the name of the root as Wabesepin

size, enters the Mississippi in lat. $44^{\circ} 52'$ about eight miles below the Falls of St. Anthony, which are in $44^{\circ} 58' 40''$, as given by Nicollet. The whole length of this course is 470 miles.

The ST. CROIX RIVER has its extreme sources in Lakes Nidjichwe, Miminis, Upper St. Croix, and other lakes that lie very contiguous to and nearly surrounding the Kagino Lake, which is the head water of the River Mashkeg, falling into Lake Superior, and another small lake that gives rise to the Wassakude, or Burnt Wood River, also a tributary of the great lake. From these sources several branches flow, and unite in one stream. It has a succession of rapids at about fifty miles below the junction, and at about the same distance below are falls, near the latitude of $45^{\circ} 30'$. From this point to the Mississippi it is a handsome and navigable stream, and expands into a lake called by the same name, by which it becomes united to the Mississippi, in less than 100 miles from the falls, in lat. about $44^{\circ} 45'$.

The CHIPPEWAY RIVER is composed of several branches, the longest of which, called Manidowish, rises in several small lakes north of 46° . It has falls below 45° , and after a short course below them of fifty or sixty miles, unites with the Mississippi, at the lower point of Lake Pepin.

The euphaneous MINI KETTE KITTIGAN, a small lake of four or five miles in diameter, in lat. $46^{\circ} 10'$, is the source of the Wisconsin River; which, with a winding course, and a succession of rapids, rolls down a small stream till below the latitude of $44^{\circ} 30'$, where it suddenly expands into a circular pool of a mile and a half or two miles in diameter at the foot of the lower rapids; and then, in a bed considerably

wider than its upper course, describing a very regular semi-circle or rather semi-ellipse, which spans about one degree of latitude, in which it receives no tributary, it approaches the Fox River of Green Bay within one mile, where, making a bend at about right angles, it runs south-west, and afterward nearly west, receiving after its recession from Fox a great many small streams, it enters the Mississippi after a course of more than 150 miles from the Fox, in lat. 43°. This latter part of its course can be made navigable for steamboats by clearing the bed of sand in some places. It is proposed to do this, and by a canal from this to the Fox, of one or two miles, to make a clear navigation from Lake Michigan to the Mississippi. All these rivers named after the St. Peter's have their whole course in Wisconsin.

Rock River rises in Wisconsin, and after a main southerly course for a considerable distance, in which it has entered the State of Illinois, it turns westwardly, and directing its current toward the Mississippi, finds that stream four miles below Rock Island and the foot of the Upper Rapids, which is the most beautiful point on the great river below Lake Pepin. Small steamboats have been to Grand Detour, upwards of a hundred miles from its mouth. This is very difficult, however, to be done in the spring floods, and can only be done then. At the best water the rapids at the mouth are only covered but little more than one foot. If the obstructions higher up this stream could be removed, those at the mouth might be obviated, by making it debouch into the Mississippi through the Marais D'Osier, or at a point a little below the village of Hampton, about midway on the rapids of the latter river. The country upon Rock River and its tributaries is one of surpassing beauty. On the Pectanon, or Pectanonica, a principal branch, commonly called Peckatonica, and on the

Yellow Creek, a tributary of the latter, the scenery is uncommonly fine.

The MOINGONAN, commonly called Des Moines, is the most important stream tributary to the Mississippi on its western bank, above the Missouri. This stream, it is said by Nicollet, is called Inyan Shasha by the Sioux, and Moingonan by the Algonquins. A river, which appears to be this, entering the Mississippi on the west, is called by Hennepin and Lahontan Otenta. It is called Moingona by Charlevoix, Des Moines (Monks' River) by Lewis and Clarke. Pike makes no mention of the river, but calls the rapids immediately above, on the Mississippi, De Moyen; on the map accompanying his volume, they are both marked with the name Des Moines. It is called by Collot, Moins (Less) River. The Shetek Lakes, the fountain of the Moingona, are on a ridge of land from which springs the source of Red Wood River, a branch of St. Peter's. It is a region of lakes and wet prairie for more than a degree of latitude south of the ridge. The Sunkaku, or Brother, is the highest principal branch on the left. The Lizard enters a short distance below, on the right. Some forty miles below, another principal branch enters on the left. The Racoon fork, after a longer interval from the last, enters on the right. This branch is about 200 miles from the mouth of the river, and a large distance above as well as most of that below, to the mouth, is navigable, being interrupted at several points at present, but susceptible, by very moderate improvements, of uninterrupted navigation for about 300 miles. The bed of this river is for the most part rock, in which it differs from the streams generally in this region, which, with some exceptions, are sandy. In the spring floods, this stream may be navigated for two or three months as high as the Racoon by

such boats as ascend the Upper Mississippi above the Rapids. To render it navigable at all times by such boats, it requires to have a few loose rocks removed, some snags drawn out, and, in a few points, an artificial embankment, to overcome the sharp angles. With these operations, the river may be navigable for 300 miles. Perhaps the making slack water at certain distances, would further improve it. Capt. Guion, of the Topographical Engineers, describes it as being the most beautiful and fertile country on which the eye of man ever rested. The Tchanshetcha Lake, which is the source of the Watumwan, a branch of the Mankato, which, in its turn, is tributary to St. Peter's, is separated from the Des Moines only one mile and a half, and by a short canal, boats may pass through into the St. Peter's.

Nicollet, in his report, gives an extended and very excellent description of this river, from which we take the following extract :

"The Des Moines empties into the Mississippi in $40^{\circ} 22'$ latitude north ; and its sources, heretofore supposed to be in 43° , are extended on my map to $44^{\circ} 3'$ north. It is fed from the beautiful group of lakes, previously described as the *Shetek* lakes, towards the middle of the plateau of the Coteau des Prairies, at an elevation of 1580 feet above the level of the sea. The waters of these lakes flow from northwest to southeast, swelling themselves by innumerable tributaries until they enter the Mississippi at an elevation of about 444 feet above the Gulf of Mexico.

"The course of the Des Moines cannot be less than 400 miles ; whence it would follow that the average of its descent is nearly three feet to the mile, with a current approaching in velocity that of the Missouri. The river flows constantly in a deep valley, from its sources to within a few miles of its confluence with the Mississippi, where it spreads over low

grounds. In its upper part, its bed is upon sand, rolled pebbles, and shingle (*gallets*).

“Like most of the rivers in this region, it has its sources in lakes and swampy grounds, and has a tortuous and sluggish course till it reaches a greater declivity about 43° of latitude, when it becomes much more rapid and direct, and frequently pitches impetuously over rocky beds of carboniferous limestone forming frequent bluffs on alternate sides. This rock, which might furnish an abundance of excellent building materials, is overlaid in some places by deposits of coal. Penned up, as it were, between the valleys of the Mississippi and the Missouri, and those of their adjacent tributary streams, the Des Moines has no large tributary of its own. Flowing through a wide and deep valley, the principal waters which it receives are the drainings through deep and long ravines, intersecting its shores, and rendering the travel along them inconvenient and painful.”

The head streams of the Illinois span a large tract of country. The Kankakee, its southern main constituent, rises in a swampy ground south of Lake Michigan, and flowing nearly westerly for more than 100 miles, unites with the Des Plaines or Maple River, both of which names are translations of its Pottawatami appellation, Sheshikmaoshike, which, from its size and the direction of its course, may dispute with Kankakee the title of principal constituent of the United Stream, at a few rods below the point where Otokakenog (uncovered breast), another primary branch, mingles with it, coming from the northwest. This last stream has received the name of Du Page, from a man who was buried on its banks.

When the three streams are united into one, it receives the name of Illinois: but it has still another primary branch coming from the northwest still further west, which enters

only twenty miles below the confluence of the others, called, by the Indians, Pishtaco, and by the inhabitants of the country, in modern times, the Fox River of the Illinois. The character of the country on the Upper Sheshikmaoshike is similar to that about the sources of the Kankake, very flat, wet and marshy, and is, for the most part, prairie or untimbered land, covered with tall grass, wild rice, and other aquatic plants. The course of the Illinois, as constituted by these several streams, is nearly south for a considerable distance. It then takes a course more westerly, and, becoming navigable for steamboats below the falls at a point where is built the town of Peru, it pursues its course through a country which, if it be surpassed, is only by the Moingona and Sini-sepo or Rock River, and St. Peter's. It is, in the whole length of the united stream, three hundred miles or more to the mouth. For fifty miles of its upper course it is not navigable, to the lower rapids; below this point it is navigable for 250 miles to its mouth. Below these rapids the current is almost imperceptible. On account of the very slight descent of the river the Mississippi when full sets back the waters of the Illinois for seventy miles. It frequently overflows its banks. The Vermillion is considerable in size, and adds a large volume to the waters of the principal river, but it is not navigable. The Mackina, Sangamon, Spoon and Crooked Rivers, lower tributaries, are sometimes set down as navigable. The Sangamon is so. Before entering the Mississippi it receives many minor streams, and the Macoupin, scarcely less than those last before named.

The other tributaries of the Mississippi on the west, between Des Moines and St. Peter's, are the Iowa and Red Cedar, both of which may be said to be navigable, the Wabesepinicon, Makwaketa, Turkey or Penaca, Upper Iowa, Haka (or Root), and Lahontan. The Tchansansan, or James

River (a tributary of the Missouri), is a fine navigable stream passing through a beautiful and luxuriant region, the following account of which is given by Mr. Nicollet :

“ We reached the river Jacques, at a very celebrated spot, called by the Sioux Otuhuoju—meaning, literally, the place ‘where the oaks spring up,’ but which I have designated on my map as the ‘Oakwood Settlement.’

“ The estimate which I have made of the distance between this place and Fort Pierre is about 110 miles ; its actual elevation above the sea is about 1,340 feet, and the descent from the Coteau du Missouri to the river Jacques not less than 750 feet. The last fifty miles, by our route, belong to the east slope of the Coteau du Missouri ; but, as we were obliged to select our ground, allowing for this, the whole direct distance is probably forty miles. In a similar way, estimating the distance to the head of the Coteau des Prairies, which is thirty miles to the east, the basin of the river Jacques between the two coteaux, and in the latitude of Otuhuoju,* may be laid down as having a breadth of eighty miles, sloping gradually down from an elevation of 700 to 750 feet. These dimensions, of course, vary in the different parts of the valley ; but what I have said will convey some idea of the immense prairie watered by the Tchansansan, which has been deemed by all travellers to those distant regions perhaps the most beautiful within the territory of the United States.

“ I hazard, in conclusion of my remarks on the physical geography of the valley just described, the suggestion that it has been scooped out by some powerful denuding cause, and that its original geological character was such as is now observed in the Coteau du Missouri and the Coteau des Prairies, by which it is bounded.

* About 45° 15'.

"It is only necessary to cast a glance over the map, to form an idea of the importance of Tchansansan river. It takes its rise on the plateau of the Missouri, beyond the parallel of 47° N.; and after pursuing nearly a north-and-south course, empties into the Missouri River below 43° . It is deemed navigable with small hunting canoes for between 500 and 600 miles; but, below Otuhuoju, it will float much larger boats, and there are no other obstacles in its navigation than a few rafts. When we turned away from the river in latitude $46^{\circ} 27'$, its breadth was from 80 to 100 feet; and we could discover by the water-marks on its banks, that, in the season of freshets, it widens out here to 100 yards, and south of Otuhuoju to 200 yards. The shores of the river are generally tolerably well wooded, though only at intervals; the trees consisting principally of elm, ash, burr-oak, poplar and willows. Along those portions where it widens into lakes, very eligible situations for farms would be found, and if the Indian traders have hitherto selected positions south of the Otuhuoju, it was doubtless in consequence of its more easy navigation into the Missouri." [From Otuhuoju to the mouth is from 250 to 300 miles. Very little is known to us of this river beyond the above very scanty description of Mr. Nicollet.]

"I have already stated, I think, that the lower portion of the Coteau des Prairies forms two spurs; one of which turns off the rivers that have been precedingly described into the Mississippi, the other into the Missouri. The divisional line of these two spurs is plainly indicated by the course of the Des Moines from $43^{\circ} 30'$ of north latitude; and the one now referred to is a prominent ridge, separating the waters that empty into the Des Moines from those that flow westwardly into the Missouri. But, as it falls off in a gradual slope when it has reached already 42° of latitude, the head-waters then

take first an E. and afterwards a SSE. direction, and are divided from each other only by moderate swells or undulations of the country, that cause them to ramify into a rain of streams, carrying their waters, after long ramblings, easterly to the Mississippi, and southerly to the Missouri, until they finally unite.

“To the north and west of Nodaway, or Snake River—meaning a particular species of snake—several important streams take their rise on that side of the Coteau des Prairies I am now considering, to empty themselves, of course, finally into the Missouri. I shall now give an account of those which appear to be least generally known.

“**INYANYANKE RIVER, or LITTLE SIOUX.**—The name of this river implies that there is a rock somewhere along its course.* It has been heretofore designated as the Little Sioux River, and has its origin from a group of lakes, the most important of which is called by the Sioux Miniwakan, or Spirit Water; hence its name of Spirit Lake. This lake has a triangular form; being about seven miles wide at its largest extremity, and seven miles in length. It is not remarkably well wooded; the smaller lakes to the north of it being better supplied in this respect.

“**TCHANKASNDATA RIVER, or SIOUX RIVER.**—This is the Big, or simply the Sioux River, and is one of the most im-

* “Inyanyanke River is said to be navigable for canoes. As I saw but the two extremities of this river, and having obtained no reliable information concerning its intermediary courses, I do not insist on its accurate representation on my map. I may most probably have placed it too high up one of its tributaries—the Otcheyedan—a name derived from a small hill, the literal meaning of which is ‘the spot where they cry,’ alluding to the custom of the Indians to repair to elevated situations to weep over their dead relations.”

portance to the country through which it flows. Its Indian name means that it is continuously lined with wood. Its sources are at the head of the Coteau des Prairies, not more than a mile from those of the St. Peter's, and separated only by a low ridge. Its length cannot be less than 350 miles ; in which distance there are two principal bends—the more southerly and smaller being terminated by a fall, said to be the only obstacle to its entire navigation. From this circumstance, the upper part of the river bears another name : the Sioux calling it Watpaipakshan, or Crooked River, and the French, la rivière Croche. It flows through a beautiful and fertile country ; amidst which, the Ndakotahs, inhabiting the valley of the St. Peter's and Missouri, have always kept up summer establishments on the borders of the adjoining lakes, whilst they hunted the river banks. Buffalo herds are confidently expected to be met with here at all seasons of the year.

“WASSECHA, or VERMILLION RIVER.—This river is scarcely more than sixty miles long. It issues from two lakes, which the Frenchmen have named Lacs aux Bois léger—Light-wood Lakes. Near its entrance into the Missouri, it forks, owing to a remarkable promontory that juts out of the prairie, and to which are attached many romantic traditions that I have not time to recount. The river is not well wooded ; it is navigable by canoes a portion of its length ; and is the last that empties into the Missouri among those flowing from the western side of the Coteau des Prairies. At its mouth is the upper end of an extensive prairie, about fifty miles long, between the Tchankasdata and the Missouri Rivers,* having some analogy in its general appearance with

* “ This is the bottom designated by Lewis and Clark as the Buffalo prairie, in consequence of the great number of these animals that they saw there. Pierre Chouteau & Co., of St. Louis, keep generally a trading-post upon it.”

the American bottom of the State of Illinois, opposite St. Louis. Belonging to this is a beautiful grove, on a point of land called by the French 'Pointe-au-Cerf' (Stag Point). The Sioux name for the prairie is Huppanokutey; or, by contraction, Huppankutey; meaning, where they hit at the elk.

"We reach now a country differing essentially from that previously described, both in respect to its climate and soil, and, consequently, in its natural productions. Whatever it may lose, however, in estimation of the agriculturist, is fully compensated to the geologist, who discovers within it the beginning of the great cretaceous formation that underlies the hydrographical basin of the Upper Missouri."

The lakes of this country could not even be named, for their multitude. A brief description of each of them would make a large volume. They exceed in number five or six hundred. A description of one of the largest, and remarkable also for the qualities of its water, called Mini-wakan, is subjoined from the report of Nicollet, frequently quoted before. It is nearly in the northwest portion of the valley. A body of water, called by the French, Mille Lacs (the Thousand Lakes), is about fifteen miles in diameter, nearly round, situated east of and near to the Mississippi.

"The appearance of Mini Wakan Lake did not realize the anticipations we had been led to form of it from popular account. The lake is on the plateau of the Shayan-oju, and is surrounded by swells and hills, varying in height from twenty to 250 feet, that so project into it as not to permit its whole expanse to be seen but from one spot, which I shall presently describe.

"The prominent hill-top, previously alluded to by the name of Miniwakan-chante, is the only beacon to the traveller leading to the lake; but even from its summits no idea

can be formed of this beautiful sheet of water. He must go to a smaller eminence, known as the Butte du Mileau by the French voyageurs, whence alone the eye can take in the principal contours of the lake.

“The greatest extension of Devil’s Lake is at least forty miles—but may be more, as we did not, and could not, ascertain the end of the northwest bay, which I left undefined on the map. It is bordered by hills that are pretty well wooded on one side, but furrowed by ravines and coulées, that are taken advantage of by warlike parties, both for attack and defence, according to circumstances. The lake itself is so filled up with islands and promontories, that, in travelling along its shores, it is only occasionally that one gets a glimpse of its expanse. This description belongs only to its wooded side; for, on the opposite side, the shores, though still bounded by hills, are destitute of trees, so as to exhibit an embankment to the east from ten to twelve miles long, upon an average breadth of three-quarters of a mile. The average breadth of the lake may be laid down at fifteen miles. Its waters appear to be the drainings of the surrounding hills. We discovered no outlets in the whole extent of about three-quarters of its contour we could explore. At all events, if there be any, they do not empty into the Red River of the North, since the lake is shut up in that direction, and since we found its true geographical position to be much more to the north than it is ordinarily laid down upon maps. A single depression at its lower end would intimate that, in times of high water, some discharge might possibly take place; but then it would be into the Shayan-oju.

“As to the natural history of the waters of the Minnawakan, it is shortly told. They are too brackish to be drunk, excepting by horses, who swallow them with avidity; they have a deeper green color than those of the neighboring

lakes that are not salt. I had no means of ascertaining the density of the water of this lake ; but having caused several gallons of it to be evaporated by distillation, I subsequently made an analysis of the residue, which proved to be a mixture of sulphates and hydrochlorates of soda and magnesia."

The true meaning of the name is undoubtedly neither Enchanted, nor Devil (as Mr. Nicollet calls it); but medicinal, or, as we usually call it, Mineral Lake. This is evident both by Mr. Nicollet's description, who says he analyzed it and found it to contain soda and magnesia in sulphates, and by his own translation of the same word when applied to a river and a hill. In describing East Medicine River (which is the English name he applies to it), he says, it derives its name from a beautiful hill on its right bank, called by the Sioux Pahah-wakan, translated by the voyageurs, "Butte de Medicine," and, in English, "Medicine Hillock." The latter word in the name is the same in each. One in conjunction with mini, water ; the other with pahah, hill. The lake should therefore be called Mineral Lake ; and the hill which they name Mini Wakan Chante is Mineral Lake Heart. The Dakota word Wakan, in the vocabulary given by Major Long, is interpreted "mysterious medicine."

There is one feature in the scenery of this country, rather too partial and confined, perhaps, to be worthy of an extended notice, but yet certainly too remarkable to be entirely passed over. In some places the limestone stands out high above the surrounding surface, isolated and naked, in the form and appearance of great mural escarpments, sometimes looking like an old castle or tower. About the Tête des Morts, in Jackson County, and near Dubuque, on the Catfish, and on the Little Maquoqueta, in the settled portion of Iowa, are some of these appearances. On La Hontan, or Canoe River, there is one very remarkable specimen of this work, in a

heap of disintegrated sandstone, thirty-six feet high, four miles north of the river. Another, on the Vermillion, called the castle, twelve miles north of the latter, on the Iowa side of the river. In Wisconsin they are more frequent.

The points most particularly interesting on account of scenery, in this country, are the Rock River Rapids on the Mississippi, Lake Pepin, St. Peter's Station, the Falls of St. Anthony, and the point of the peninsula between Lakes Superior and Michigan. It is scarcely possible, says Charlevoix, speaking of this last, to see a more beautiful country than this tongue of land. It is terminated by a handsome river, Manistic, which is full of fish of all kinds.

This description of the physical geography of the country, will not present a clear and vivid picture to one who has not seen a similar, but who has been confined to a forest or a mountain scenery. The mighty rivers of this region must be measured by travel, the prairies must be crossed, and the lakes be mirrored to the eye, before the mind comprehends the terms of the description.

"To look at a prairie up or down," says Nicollet, "to ascend one of its undulations ; to reach a small plateau (or, as the voyageurs call it, a *prairie planché*), moving from wave to wave over alternate swells and depressions ; and, finally, to reach the vast interminable low prairie that extends itself in front,—be it for hours, days, or weeks, one never tires ; pleasurable and exhilarating sensations are all the time felt ; *ennui* is never experienced. Doubtless there are moments when excessive heat, a want of fresh water, and other privations, remind one that life is toil ; but these drawbacks are of short duration. There is almost always a breeze over them. The security one feels in knowing that there are no concealed dangers ; so vast is the extent which the eye takes in ; no difficulties of road ; a far spreading verdure, relieved

by a profusion of variously colored flowers ; the azure of the sky above, or the tempest that can be seen from its beginning to its end ; the beautiful modifications of the changing clouds ; the curious looming of objects between earth and sky, taxing the ingenuity every moment to rectify ;—all, everything, is calculated to excite the perceptions, and keep alive the imagination. In the summer season, especially, everything upon the prairies is cheerful, graceful, and animated. The Indians, with herds of deer, antelope, and buffalo, give life and motion to them. It is then they should be visited ; and I pity the man whose soul could remain unmoved under such a scene of excitement."

PART II.

HISTORY.

THE History of this country, though modern, brief, and scanty in incident, is yet mixed with fable. It was early visited by the French voyageurs and missionaries from Canada ; but the object of the voyageurs was trade and gain ; and while their talent lay not in writing, their interest probably prompted them to withhold, rather than blazon, the discoveries which they made. Gabriel Sagard, a Franciscan missionary, if he is to be believed, was in the country of the Hurons, about the Lake of that name, as early as 1624, and went as far as Mackina. French missionaries were settled in Michigan in 1634. In 1634, we learn from Charlevoix, Breboeuf and Daniel, missionaries were with the Hurons ; and about eight years after, it is stated by the same good authority that others went to the Sault St. Marie.

About the same time (1642) some Jesuits received a deputation of the Saulteurs, who invited them to go into their country. These savages then occupied the country about a rapid which is in a strait by which Lake Superior is discharged into Huron. It has since been named Sault St. Marie. The missionaries were pleased with the opportunity of knowing the country, which none of them had ever traversed. Father Isaac Jogues and Charles Raimbaut were sent to

attend the deputies of the Saulteurs ; and their voyage had all the success that they could reasonably expect. They were well received by the savages, who seemed to them to be a very good people.

Father Mesnard, a Jesuit missionary, it is related, was with the Indians on Lake Superior in 1661, and in 1665 Alouez, a missionary of the same order, traversed the same, and the other northern lakes ; and in 1668 he, with Dablon and Marquette, formed a missionary settlement at Sault St. Marie. I think this event is placed by Mr. Bancroft in 1669. In the same year other missions were established by the Jesuits in the country near the Lakes.

These enterprises made known the country, and in 1671 Mr. Talon, the king's lieutenant of Canada, took measures to secure the dominion of France over all the northwest. For this purpose he selected Nicholas Perrot, a man of good capacity and education, and having furnished him with a sufficient force, and given him the proper instructions, sent him forth on his expedition. Perrot went as far west as Chicago, at the bottom of the Lake Illinois, now called Lake Michigan, where the Miamies were then residing, and visited all the northern nations with whom the French at that time had any trade, and invited them to meet him in the following spring at the Sault St. Marie. At this Congress all the nations of the north were present, by their delegates, except the Mascoutins, Kickapous, and Illinois, to whom, for want of time, notice of the meeting was not given. The Illinois were then on the Mississippi. The Sieur St. Luson arrived at Sault St. Marie in May, charged with a special commission to take possession of all the country occupied by these people, and to receive them under the protection of the king. The ceremonies on the occasion were an address by Perrot, the erection of a cedar post and a cross, with a declaration

by St. Lusson of the act of taking possession, and of the protection of the king.—(*Charl. Hist. de Nouv. Fr.*)

This was the first political event that transpired in the lake country, in which Europeans were parties; the former intercourse with the country having been for the purposes of trade or of religion. And as it is the first, so it is also one of the most important political epochs in its history. It differs also from prior pages in being authenticated, while the events that are said to have preceded it, as well as some subsequent relations of discoveries beyond the lakes, to the west, must be considered as apocryphal, or rejected as wholly spurious.

Mr. Talon, having been very active in setting on foot expeditions for discovery in the north and west, and in extending the dominion of France over the nations inhabiting or rather roaming over those countries, was anxious to discover the sources, course, direction, character, and outlet of a great river which had been mentioned to the French by the Indians, and which was supposed to reach the sea on the west, or to fall into the Gulf of Mexico on the south. This river was called by the Indians Massa-sepo, or Missi-sipi, great river. For this purpose he sent father Marquette, a Jesuit, who had been at Sault St. Marie, with Joliet, a citizen of Quebec, and two or three voyageurs, to ascertain the truth of their representations. Talon, at his own request, was recalled in 1672, and the discovery of the river, which has been imputed to Marquette, though it may be doubted, and the more extended discoveries of Hennepin, Tonti, and La Sale, La Hontan and La Sueur, were accomplished under the government of his successor, Count de Frontenac.

Whether Marquette ever, in fact, performed the service to which he had been appointed by Talon, and actually discovered the Mississippi, must be considered rather apocryphal. It is not to be stated as an authentic event, or as one, even,

demanding the credence usually given to the higher class of probabilities.

Marquette himself never returned to Quebec to give a relation of his voyage, but remained a year or two, after the supposed time of its occurrence, among the Indians living about Lake Illinois (now Michigan), and died there in 1675. It is generally stated that notes of the voyage were not preserved by himself or his companion. His patron, Talon, had gone to France before he went (if he did go at all) to the Mississippi. The brief narrative that has been published of their supposed voyage, does not name the point from which they embarked, on or near the Strait of Machinac. It was not published till after the upper Mississippi had been explored by Hennepin and La Sale. It gives no particulars which were not made known by them; and there is much discrepancy as to the time when the voyage is alleged to have been performed. In the relation published in the name of Marquette, it is stated that they embarked on the 13th of May, 1673, and arrived at the Mississippi on the 17th of June. The statement published in the name of Joliet dates the arrival at the Mississippi the 15th of June, 1674, differing both in the year and the day. Heriot, again, states it to have taken place in June, 1672. Book-making was then, as now, a trade at Paris, Amsterdam, and London; and it is probable that the few brief pages annexed to Hennepin, *Description d'une nouvelle pays, &c.*, purporting to be the statement of Marquette and Joliet, and the whole of the volume was a work manufactured by some author to suit the reading market of the time. Such was the case with the work ascribed to the Chevalier Tonti, the companion of La Sale, who, when the work was mentioned to him by Mr. Iberville, denied having any hand in it, saying, it was apparently written by

some adventurer, who, having some defective notes of the country, had published them under his name.

In addition to the other circumstances which make the authenticity of the relation published as Marquette's doubtful, Lochman, who published a collection of the travels of the Jesuits, printed in London, in 1743, makes no mention of the pretended voyage of Marquette—but in his preface he has this remark: "The Jesuits have been proved to exaggerate so greatly in their accounts, to give so much into the marvellous, and to assert so many falsities, that, like the shepherd's boy in the fable, many people wont believe them, even when they do speak the truth. For this reason I judge it necessary to examine their relations very carefully, and to compare them with those of such travellers as are in the greatest repute for their veracity and talents." The omission by so judicious a compiler to include in his work a narrative of so important a discovery as that of the Mississippi River, with remarks like the foregoing, coupled with the facts, that Marquette's journal was said to be lost, and that in the narrative published as his, no particular descriptions are given, shows that the relation ascribed to Marquette was, as above supposed, considered spurious, or that, if genuine, it was included in that class of travels that were unworthy of belief.

The supposition applied to this, that it was the work of a literary speculator, may be also extended to the second volume of Hennepin, as already hinted. But there is more probability in favor of his first volume. Indeed, the fact that he ascended the Upper Mississippi in 1680 is beyond doubt; and it is quite probable that he was the first discoverer of that river. Before, however, entering upon the relation of his very important expedition, the substance of the relation of Marquette will be given, which, whether true or not, yet, having been frequently referred to by writers as credible, and

particularly in a late history of this country, by an author of much literary fame,* I should not feel warranted to lay aside as condemned, and wholly to omit.


One other step, also, in the progress of discovery in this region precedes both the voyage of Hennepin and that of Marquette. In the year before Marquette's voyage, that is, in 1672 or 1673, Claude Alouez and Dablon, the two missionaries who had been with him in 1668 at the Sault, ascended the Fox River. In passing up the river, they perceived, on the banks of the rapids, a kind of idol, very badly formed, and which appeared rather as a freak of nature, where they had expected to find a work of art. It was a rock, whose summit, at a distance, appeared to be in the likeness of a man's head; and the savages had taken it for the tutelary deity of their country. They had painted it all sorts of colors, and never passed it without offering tobacco, arrows, or something else. The missionaries, to satisfy the Indians of the impotence of their pretended divinity, overturned the stone into the river."—*Char.*, vol. ii., p. 250.

On the 13th of May, 1673, Father Marquette, a Jesuit, embarked, as the relation says, with Mr. Joliet, a citizen of Quebec, who was the director of the expedition, and five other Frenchmen, at some point on or near the Strait of Mackinac, which is not named, and arrived at the Bay of Puans (Green Bay), at a village inhabited by Kikapoos, Miamis, and Mascoutins, where they obtained guides, who accompanied them on their way as far as the Wisconsin River; and passing down the Wisconsin (miscalled, in the relation, the Mesconsin), they arrived on the Mississippi on the 17th of June. They proceeded down the river, from the mouth of the Wisconsin, more than one hundred leagues,

* Bancroft.—History of the United States

without exploring the country, or seeing any of its inhabitants, so far as mentioned, except that, three days after leaving the Wisconsin, they discovered a much better country; when, on the 25th of June, being the eighth day of their travel on the Mississippi, they went ashore, and found some fresh traces of men upon the sand, and a path which led to a prairie. The men remained in the boat, and Marquette and Joliet followed the path till they discovered a village on the banks of a river, and two other villages on a hill, within half a league of the first, inhabited by Illinois Indians. It is not stated on which side of the Mississippi the river was found, nor is it described by any name, or otherwise designated by the travellers. Mr. Bancroft supposes it to have been the Des Moines. This river, in fact, flows into the Mississippi, at about the distance mentioned.

The relation makes mention of passing the river Peckitanoni, as the Missouri was then called, and the Ohio, called by them the Ouabouskigou, the name of the Wabash being preserved till its junction with the Mississippi. The Chuoanous (Shawnees) inhabit the banks of the Wabash, the relation informs us, who are said to be so numerous, that they have thirty-eight villages on the river. They descended the river as low as lat. 33°, where they found a village of the Arkansas; and being satisfied that the river flowed into the Gulf of Mexico, they turned their course up the stream, and, ascending the river, they passed through the Illinois to the Lake. Their relation gives the distance from the Pekitanoni (or Missouri) to the Ouabouskigou (or Ohio) at twenty leagues. The actual distance is two hundred miles. So great a mistake could hardly be made by a person who had been over the ground. Nothing whatever is stated in relation to the country traversed, which was through nine degrees and a half of latitude, and, by the windings of the stream,



one thousand miles, or more, except finding the three rivers, Des Moines, Missouri, and Ohio, and Indian villages at three points on the river.*

* The foregoing is abstracted from a narrative appended to the work published in the name of Hennepin, called "Nouvelle Découverte d'un Pays vaste," and comprising twenty-six pages. Marquette's relation is said, by Charlevoix, to be contained in the "Recueil des Voyages de Thevenot," printed in Paris in 1687. I have not seen Thevenot, but it is probable that the relation referred to is the same as that from which the above is abridged. But all relations put forth under the name of Marquette must be considered apocryphal.

Additional Note.—The relation as contained in Thevenot has just been published in Paris. It is the same referred to above. It is impossible to conceive that a person who has made a discovery so important, should pass, for the space of one thousand miles, down this noble and majestic stream, in itself one of the wonders of the world, and then new to all the world save himself and a few hunting bands of Indians, and possessing some very remarkable peculiarities; and should, in a volume expressly designed to communicate his great discovery to the world, have given such a meagre account of it; passing the two chains of rapids without intimating or apparently knowing that such were on the river; naming none of the eight considerable rivers coming in from the west, nor those on the other side, except three of the principal streams which might be known by accounts given by the Indians. The book states but two items in relation to the country—that there was a chain of very high mountains on its bank, immediately below the Wisconsin; which is an error, there being no such chain. The only elevation here is Pike's Mountain, and that but little more than two hundred feet above the common level. The other is the distance from Missouri River to Ohio, two hundred miles, said to be twenty leagues. While everything is omitted that would naturally be told, the volume relates that they saw geese and swans without feathers, as these birds had a fashion of shedding them at this season; and also monstrous fish, and other monsters. Beside all this, it is known that Marquette never went east of Lake Michigan after the pretended voyage, but died on the lake about two years after. And the relation under his name was not published till eight years after the voyage, and a year or more after the discovery by Hennepin, and then came forward to fill up a desideratum in a collection of voyages published by Thevenot, which could not decently appear without a notice of this river, the discovery of which had then

Soon after the time when this expedition is stated to have happened, Mr. Robert Cavalier de la Sale was appointed by the king of France to conduct an expedition, and make discoveries in the north-western parts of North America. Mr. Tonti was associated with him in the enterprise. On the 7th of August, 1679, they embarked with Father Louis Hennepin, a Franciscan missionary, and two other priests and thirty men, on board a small vessel which La Sale had built, at a short distance above the Falls of Niagara, and commenced the voyage. They proceeded up lakes Erie, St. Clair, and Huron, and passed into the lake called Illinouac by the Indians, Illinois by the French, and now known as Lake Michigan. Lake Erie was at that time known under the name of Conty; Huron was called Orleans; Michigan, Dauphin and Illinois; Superior, Conde and Tracy; and Ontario, Frontenac.

After pursuing the voyage as far as the Bay of Puans, now called Green Bay, La Sale sent back his vessel to Niagara, while himself and his associates proceeded to the Southern part of the lake, where by appointment they were to await the return of the vessel. The ship however foundered on the lake, and nothing was afterwards heard of vessel or crew.

La Sale and his remaining associates coasted southward along the western shore of the lake as far as the mouth of a river designated by Hennepin as the river of the Miamis, now called St. Joseph's, which was the point agreed upon between them and their companions who had departed in the ship, as the place of rendezvous, and where they were to be

become known. Further: the express object of La Sale's expedition was to discover the Mississippi—which could not have been if it had been already discovered, as pretended, six years before he undertook it, by his own countrymen, under the direction of his own government.

joined by some of their company whom they had left at Mackinac. Here they built a fort. They then passed up the river as far as the point where a narrow portage of about a league divides it from the Kankakee or southern branch of the Illinois River, where they crossed to the stream last named. This branch of the Illinois was called by the Indians Theakeke, wolf, because the tribe of Indians called by that name, commonly known as the Mahingans, dwelt there. The mode of speaking it by the French was Kiakiki, and became corrupted to Kankakee. From the point of landing on the Miami River the portage extended over a wet champaign to the neighborhood of the source of the Theakeke, on which, at a village inhabited by Miamis, Mascotins, and Ouiatinons, the hardy and intrepid voyagers launched their bark canoes to descend by the Illinois and Mississippi Rivers, only heard of, but unknown before, through vast regions of unrevealed and doubtful country, whose forest and prairie might then, so far as known to them, receive for the first time the foot of man, or might resound with the yell of the lurking and blood-loving Indian. The Theakeke springs out of lands which are so miry that a person can scarcely walk over them. And the country, for a great extent, upon the river, is of the same description. "That country," says the relation, "is nothing but marshes, full of alder trees and rushes, and we could have hardly found, for forty leagues together, any place to plant our cabins, had it not been for the frost, which made the earth more firm and solid." The company had taken their departure from the Fort at the mouth of the St. Joseph's, or River of the Miamis, on Lake Michigan, on the 3d day of Dec., 1679, and it was near the close of the same month when they arrived at the village of the Illinois, on the river of that name, a distance of more than one hundred leagues from the Fort. In this journey, after pass-

ing through the great marshes already mentioned, near the sources of the Theakeke, they came to a vast plain, on which nothing grows but grass and weeds, which at that time were dry and burnt, it being the custom of the Miamis to set them on fire every year for hunting the buffalo. From this, it appears that the annual burning of the prairies is an ancient practice of the Indians. It is supposed to be owing to this custom that those large tracts in the west are destitute of timber.

The travellers embarked again at the Illinois village, and continued to fall down the river for four days longer, when, on the first day of January, 1680, they came into and passed through a lake which is described as seven leagues in length and one broad, and was called by the Indians "Pimiteoui" (pimitewi), that is, *a place where there is an abundance of fat beasts*—a common way of describing a place by them; as Missi limachinac, *a great plenty of turtle*. This lake is that enlargement of the river now known to the western settlers and travellers as Lake Peoria. It is said in the narrative that the river never freezes below the lake.

There was a village of the Illinois Indians at this lake, who endeavored to dissuade the travellers from their design of descending the Mississippi and navigating that stream;—representing it as inhabited by very ferocious tribes of savages, filled with formidable animals, full of rocks and rapids towards its mouth, which falls into a hideous and bottomless gulf, and horrid whirlpool, that swallows up everything coming within reach of its force. The travellers remained with these Indians some time, and at the foot of the lake they built a fort, which La Sale called Crevecœur, and to which the Indians gave the name of Chicago. Terror of the Indians, and the hardships and perils of the travel, had caused the desertion of several of his men. He had lost his ves-

sel, and the lives of others had been sacrificed with that accident, and he was surrounded with perils and difficulties. These circumstances of grief and disappointment may have suggested the name which he gave to his fort.*

Thus far, however, though having had perils to encounter, and having experienced some disappointments, they were not greater than might be anticipated in such an undertaking. It was now, also, mid winter, and they had to encounter the rigors of a northern climate. Yet their undertaking was not frustrated, and they had information of a better state of things before them. They learned, by conversation with other Indians, that the dangers of which they had been told by the Illinois did not exist, but that the Mississippi was in fact navigable from its source, and was inhabited by well disposed Indians who would offer them the pipe of peace.

La Sale therefore resolved on pursuing his enterprise, and took his measures accordingly. He directed father Hennepin to proceed to the Mississippi with two of the company,

* Fort Crevecoeur was built upon an elevated site on the bank of the river, the exact location of which may be determined by the following extract, which probably has relation to the same spot, from Mr. Patrick Kennedy's Journal of an expedition undertaken by himself and several *coureurs de bois*, in the year 1773. The journal is a circumstantial account of a progress up the Illinois River. He says:—

“August 7. This morning being very foggy, and the river overgrown with weeds along its sides, we could make but little way. About 12 o'clock we got to the old Pioria Fort and village, on the Western shore of the river, and at the southern end of the lake called the Illinois Lake, which is nineteen miles and a half in length, and three miles in breadth. It has no rocks, shoals, or perceivable current. We found the stockades of this Pioria Fort destroyed by fire, but the houses standing. The summit on which the fort stood, commands a fine prospect of the country to the eastward, and up the lake to the point where the river comes in at the north end.” He gives the distance from the mouth at 210 miles, and above Lake Demi Quian 39 miles.

while himself, with three others, should return to Fort Frontenac, where they had first embarked, to procure some further supplies ; and that the Chevalier Tonti, with the rest of the men, should remain to garrison the fort at Crevecœur. Here he remained with his little band of soldiers for many years. The companions of La Sale, in the subsequent disastrous expedition in which he lost his life, found Tonti still at the fort, in 1686, and La Hontan also, in 1689, says he was then residing there, when he returned from his expedition up the St. Peter's.

Father Hennepin, accompanied by only two Frenchmen, Anthony Auguel, surnamed Picard du Gay, and Mitchel Ako, left Fort Crevecœur on the 29th February, 1689, and on the 7th March, reached the Mississippi. Hennepin, with his companions, proceeded up the river as far as the falls, which were named by him St. Anthony of Padua. He observed the Des Moines River (called Otenta), and another at the west, which was probably St. Peter's, but which he does not mention by any name. This river, some years after the date of its discovery, by Hennepin, received the name of St. Pierre, from a trader of that name, who resided upon it. It has been suggested, however, that the true name of this river is "Sans Pierres," without stones : it being at the mouth entirely clear of stones. A few years after this time, the Des Moines, or Otenta, is mentioned in the maps by the name of Moingona. He found also the Black River, on the east side, above the Wisconsin, which was called by the Sauteurs (or Chipewas), Sappah, and by the Naudowessious, or Sioux, Chebadaba. And above the Chebadaba, he entered the beautiful and romantic lake which he called the Lac des Pleurs, and which has since received the name of Lake Pepin * The

* Major Long says it was first called Lake Pepin in the manuscript of Le Sueur ; Charlevoix calls it Bon Secours.

travellers proceeded up the St. Croix River, which they called Rivière de la Tombeau, because an Indian grave was there. On the 12th of April they were captured by the Isauti,* or Chippewa Indians, and were unable to proceed further than the St. Francis River. They were informed by the Indians, that there was another fall, about twenty or thirty leagues above St. Anthony's, near which lived a tribe of Indians called Tintonha, or prairie Indians. Having remained two or three months in captivity they passed down the river, leaving Ako behind, and ascending the Wisconsin, passed down the Fox River to the Bay of Puans. While they were passing Lake Pepin with their Indian captors, a council was held to deliberate on putting to death the prisoners. Those who were in favor of this design cried all night, as is customary with them when they wish to prevail on their companions to consent to the death of their captives. On this account it was named by them Lac des Pleurs, as before mentioned.

Father Hennepin must undoubtedly be considered the discoverer of the Mississippi. The supposition that Marquette was there before him, may or may not be in accordance with the fact. No relation was given of it; no information or advantage appears to have been derived from it. When La Sale started on his expedition from Fort Frontenac, it seemed to be for the purpose of *discovering* a river known only to the Indians, not of merely visiting a place already known. It is also stated in the volume which passes as the second work of

* The Indians of the St. Mary's were called by the French, Sauteurs (that is, Indians of the falls) of St. Mary's. Those who dwell by the Falls of St. Anthony, were called also Sauteurs, and corruptly Isati (Esàute). They are the Chippewas. The name of Naudouessies, by which the Sioux were called, was probably Nordouest, applied to them by the missionaries and traders of Lakes Superior and Mackinac, who had been acquainted with them some years, and which the Indians converted into Nordouessi.

Hennepin that he saw Joliet at Quebec, and being informed that he had been upon the Mississippi, he questioned him in relation to it; and was answered that he had never been further than the country of the Hurons and Ottawas. These Indians inhabited, the first south, and the last north, of the Straits of Mackinac. This story of the interview with Joliet may or may not be true; but there is nothing, leaving it out of the case, to induce even a strong belief that Marquette and Joliet had been to the great river; and the honor of its discovery must be given to Hennepin.

La Sale having made his preparations to maintain the position he had established at Lake Pimitewi, as a point d'appui for the prosecution of his discoveries, returned to that post, and in 1682 he descended to the Mississippi, and fell down that stream to its mouth. And this is the first undoubted discovery of the Lower Mississippi, though the narratives before mentioned have related that both Marquette and Hennepin had gone down the river nearly to its mouth. It was in March that La Sale came to the Mississippi and prosecuted his discovery to its mouth.* He took possession of the country of the Arkansas Indians, and arriving at the mouth of the river on the 9th of April, took possession of the country there according to law—[*Ch.*, v. 2, p. 276]. On the 11th he reembarked and ascended the river. On this voyage he left colonies at Kaskaskia and Kakokia.

The country of the lower Mississippi is not within the scope of this work, and events relating to it will be briefly noticed only as they have connection with the discoveries or settlements in the upper country. La Sale, after his voyage down the river, returned to France for the purpose of making a

* Charlevoix says he embarked on the Mississippi on the 2d of February, and going down the river, took possession of the country of the Arkansas on the 4th of March.

voyage thence by sea to discover the mouth of the Mississippi ; and in 1684 he sailed with a large force destined for the Gulf of Mexico. He was unsuccessful in his design of finding the mouth of the river ; but having built and fortified two forts on the gulf, which he garrisoned with some of his men, he departed from the Bay of St. Louis, in the northwest part of the gulf, to make an overland expedition to his fort on the Illinois, and to obtain a knowledge of the country and its inhabitants. After travelling 150 leagues to the northeast, he returned to his fort in the Bay of St. Louis on the 17th of October, 1786. Having remained here two months, he resolved to make a second attempt to pass over to the Illinois River, and taking twenty men with him, he departed a second time from Fort St. Louis, resolved not to return till he had found the Illinois. His second departure from the fort took place on the 7th of January, 1687. Before he had proceeded as far as on his first attempt, he was murdered with three others of his company, by some of his own men. His brother, M. Cavalier, with father Anastasius, M. Joutel, and others of the party, made their way to the Illinois, and up the river to Crevecoeur, where they found Mr. Tonti and his garrison, and were hospitably received, and after remaining some days, proceeded on to Quebec.

The next voyage in order of time is that of the Baron Lahontan. He started from Machinac on the 24th Sept., 1688, and from the Bay of Puans, called by him the Bay of the Potawatamies, on the 30th of the same month, with a large detachment of French and five Ottawa hunters, provided with new canoes filled with provisions, munitions of war, and articles for traffic with the natives. Near the Bay, on the banks of the Fox River, at the time of Lahontan's voyage, were villages of Sakis, Potawatamies, and some Malominis, and the Jesuits had a house there. A great

trade was carried on in peltries and Indian corn, which the savages trafficked with the *coureurs du bois*.

At this period, and even prior to the first enterprise of La Sale for the discovery of the Mississippi, there was a considerable trade with the Indians of this region. It is said in 1779, that more than two hundred loaded canoes pass through the Straits St. Marie and Machinac to Montreal.

Lahontan entered this river on the 29th September, and the warriors of each of the three nations came in turn to his cabin to entertain him with the dance of the calumet and of the captain: the first in token of peace, and the second in compliment to the traveller, to signify their consideration and regard for him. He departed from this place on the 30th September, and passed up the Fox River, which he called the River of Puans. In his passage up the Fox he stopped at a village of the Kickapoos, and of the Malominies, to whom he made presents, receiving in return two or three bags of the meal of wild rice. He arrived on the 9th at a fort of the Outagamis, where he was well received, and left on the 11th. On the 13th he landed at a place where he found the Chief of the nation. He here received an accession to his company of ten Outagami warriors. This fort was at half a day's journey from the head of Fox River or Puans, and embarking at noon on the 16th, he arrived on the evening of the same day at the portage of the Wisconsin. They were occupied two days in transporting their canoes and baggage over this portage. He describes the Fox as *salt* and muddy. The country upon the river seems to have been anything but agreeable to him. He speaks of the river as desolate, and says it is bordered with steep hills, marshes, and frightful rocks. On the 19th of October he embarked on the Wisconsin, and in four days he was at the Mississippi. Passing up the Mississippi he came on the 2d

November to a river which he called Long River. On the 3d he entered into the mouth of Long River, which he describes as forming a sort of lake full of rushes. The river, he remarks, is the stillest in the world. He ascended the stream 200 leagues, which occupied him sixty days. He lays down the course of the river from west to east. It is not easy to conclude, by the account given of this journey, upon what river Lahontan travelled this great distance upon the course he describes. The course of St. Peter's is at this day very different, being first for a large distance from its source from northwest to southeast nearly, and in the latter part of its course about south southwest, and north northeast. If he ascended St. Peter's to its source, he might easily have passed to the waters of Red River, which now at times mingle with those of the former. Mr. Nicollet supposes that Cannon River answers to the Long River of this traveller. The station of the traveller, the large number of his company, the incidents which he relates, and the particularity of his description, forbid the idea that his narrative is purely fabulous. But there is not, at this day, any stream in that region upon which he could have ascended so far. If he had gone upon the waters of the Red River he could not have failed to perceive that he was going down and not ascending the stream. The Cannon River is a short stream, upon which he could navigate scarcely one sixth of the distance named. We must suppose that since that time, a considerable change has taken place in the waters of that country. It may be, that Cannon River communicated with St. Peter's, or with other waters, and that beyond, to the west, some communication existed with the Missouri.

This supposition is not unsupported. The early travellers to this part of the country received accounts from the Indians of a vast lake that existed, as they said, far to the northwest,

which they represented as larger than Superior. Charlevoix speaks of this lake, as well as other writers of that time. "The country of the Assinipoils," he says, "is in the neighborhood of a lake which bears their name, with which we are but little acquainted. A Frenchman, whom I saw at Montreal, assured me he had been there, but had seen it only in a transient manner, as one sees the sea in a harbor. It is the common opinion that this lake is 600 leagues in circumference; that its banks are delightful; that the climate is very temperate, though it lies to the northwest of Lake Superior, and it contains so great a number of islands, that it is called in that country the Lake of Islands. Some Indians call it Mitchinipi (Great Water); and it seems, in effect, to be the reservoir or source of the greatest rivers and all the great lakes of North America. All the following rivers are said to have their rise from it: the Bourbon, which runs into Hudson's Bay (Red River); the St. Lawrence, which carries its waters to the ocean; the Mississippi, which falls into the Gulf of Mexico; the Missouri, which mixes with the last; and a fifth, which they say runs westward, and consequently discharges its waters into the South Sea. I do not, however, warrant all these facts, which are supported only by the accounts of travellers; and, much less, what the Indians have related, that in the neighborhood of the lake are men resembling the Europeans, who are settled in a country where gold and silver are so common that they are employed in the meanest uses."

The face of the country, and the peculiar physical characteristic which it at present has, being diversified with a cluster of numerous lakes, which, with the addition of a body of water not very great, would make a Lake of Islands as extensive as that named, favor the story. A branch of Red River, rising in the country of the supposed lake, now bears

the name of Assinaboin, *and a tributary of the last, called Mouse River, rises within a mile of the Missouri.*

Long says, "although many have supposed that the waters of the Mississippi are separated from those running northwestwardly into the Pacific, and northeastwardly into the Atlantic, by a mountainous range of country; yet, from the best information that can be had on the subject, the fact is quite otherwise. The old and almost forgotten statement, of savage origin, that four of the largest rivers of the continent have their sources in the same plain, is entitled to far more credit. The rivers alluded to, are the Mississippi, St. Lawrence, Suskatckawan, and Oregon.* Agreeably to the accounts of Col. Dixon, and others, who have traversed the country situated between the Missouri and Assiniboin, a branch of the Red River of Hudson's Bay, no elevated ridge is to be met with; but, on the contrary, tributaries to both these streams take their rise in the same champaign. The water courses are represented as chains of lakes of various magnitudes, while lakes and stagnant pools are scattered in every direction, without ridges or perceptible declivities, to show the direction in which they are drained."—V. ii., p. 380.

The tract included between the Mississippi, Crow Wing, Red River, and the ridge spreading over the sources of the Mississippi, forming nearly a parallelogram of 100 by 150 miles, lying northeast and southwest, is mostly, at this day, a collection of lakes and water. There is very clear evidence, from geological indications, that the whole Upper Mississippi was, at one time, submerged; and it is highly probable that, in the gradual subsidence of the waters, which

* Colonel Long is probably mistaken in naming the Oregon as one of the four alluded to. Charlevoix is probably more correct in naming the rivers.

may not have taken place in 1690 or 1700 to the extent it has now attained, a great lake may have covered all that area,—or, at least, that the physical geography of the country at that time may have presented some difference in the quantity and disposition of its hydrographical outline. In the present century, the Missouri has so changed its course that Nicollet was unable to find some of the bends described by Lewis and Clarke, thirty years before.

The supposition of Nicollet, that he passed through Cannon River, is not improbable. The sources of Cannon River are within four or five miles of an eastern branch of Blue Earth River, and the intervening ground is a perfect level. The communication may, at the time of the voyage, have been complete, or been made so by a freshet, and he would thus have passed through the Blue Earth into St. Peter's. It is not improbable that the St. Peter's itself once pursued this course, more in unison with the course of the river higher up, and disembogued where the mouth of Cannon River now is. At this day the St. Peter's, at the mouth of the Blue Earth, makes a bend at right angles with its former course, as stated above. It is well known that at high stages of water, boats may now pass into Rock River through the Marais D'Osiers, thirty miles above the mouth of Rock River.

Lahontan's descriptions are too particular, and his narrative too circumstantial and too probable, to one acquainted with the northwest, to be discredited, merely on account of a supposed impossibility of performing the voyage, because of the physical unfitness of the country at this day. His work was, it is true, decried in its time by the Jesuits, but this was for the reason that he had spoken lightly of them; and, because, from ignorance of the country and the people, statements which are now known to be correct, would then have

been deemed improbable, and received with distrust. After navigating the St. Peter's, Lahontan went down the Mississippi, taking notice of the Des Moines River, which he called Otenta; the same name by which Hennepin had designated a river falling into the Mississippi from the west; visited a village of Otenta people, probably Illinois, and passed down to the Missouri, up which he sailed some distance, meeting some Arkansas and a band of unknown Indians, and proceeded down as far as the mouth of the Ohio, called by him, Ouabach (Wabash); and then, ascending the Mississippi, passed up through the Illinois, on which, at Fort Crevecoeur, he met with Sieur Tonti, who, it appears, was yet remaining where he had been left nine years before by La Sale.

Lahontan was probably the first European who had ascended the Missouri, as well as the St. Peter's, and must be considered the discoverer of both these noble rivers.

The river now called Des Moines, was laid down in the map accompanying Lahontan, and mentioned by him, and also by Hennepin, under the name of Otenta. In Charlevoix, and in the *Histoire Generale des Voyages*, published in 1757, it is called Moingona.

A person who has seen this country, knows that it has undergone great changes at more than one epoch. It bears evidence that at one time the whole surface of the Mississippi valley has been submerged; and we make a short digression in this place, to state more fully our opinion on this matter. There is no doubt that, at some remote period, by the convulsion of an earthquake, the land of this valley has been upheaved, and has thrown off the water that covered it, which may have extended from the Gulf of Mexico to Hudson's Bay, separating our hemisphere into two continents. Such was my own decided opinion, frequently

expressed, at the first sight of this region; and I have found since that others have had the same opinion. There has been a second change subsequently, in which the streams that drained off the waters of this country have been confined within narrowed beds. Upon all the streams of this country, the banks at present confining their waters are low bottom lands, the alluvion of the streams, generally from six to twelve or fifteen feet in the principal rivers above the common stage of water. Behind these are bluffs forming a wider bed, in which it is probable the stream once flowed. My conjecture is, that at some upheaving of the earth by an earthquake, since the epoch of the denudation, another part of the lakes and waters, that had been left after the first, has been thrown off, and thus the streams, which convey off these waters, have been diminished and their beds narrowed. In 1663 Canada was visited by a very violent earthquake, which probably extended to this country. It is known to have extended west to the region of Lake Michigan. To Europeans the Mississippi country was then unknown. My conjecture is, that this earthquake not only was felt at that period on the Mississippi, but that it may have been repeated also, or rather continued, and that, by a gradual upheaving, the consequence of these earthquakes, a change may have been effected in the hydrographic condition of this country since it was seen by Lahontan, and that rivers may have extended then farther than their channels now run, and some of the ground then forming their beds has become dry. Though there is no authority for stating that this earthquake actually rent the earth of the Mississippi valley, yet, as it is known to have been felt in a neighboring region, and probably was here also, the relation is here given as connected in its effects, though not in time, with this portion of our story. The story is, in the main, true, though the

lights in the air and the lowing of the sea-cows may have been painted by the alarmed imagination of the witnesses.

In 1663 Canada was visited with a great earthquake, which extended nine hundred miles east and west, and perhaps further. The following account is given by Charlevoix :—

“Trees were thrown into the air with as much force as if a mine had been exploded under their roots, and some were found fixed in the earth by their tops. A person could not feel more secure upon the water than upon the land. The ice which covered the River St. Lawrence and the streams, was broken and thrown together ; large blocks of ice were thrown into the air, and the places which they had left threw up a large quantity of sand and mud. Many fountains and small streams were dried up ; in others, the waters were impregnated with sulphur ; and there were some whose beds even, in which they had flowed, could not be distinguished.

“Here the waters became red, there they turned yellow ; those of the river were all white, from Quebec to Tadoussac, a space of thirty leagues. The air had, also, its phenomena. A constant thundering was heard in it ; they saw, or imagined they saw, in it spectres of fire, bearing torches in their hands. Flames appeared in it which took all sorts of figures—some of pikes, some of lances ; and burning brands fell on the roofs without setting them on fire. From time to time moanings increased the terror. Sea-cows were heard lowing on the Three Rivers, where never before these fish had appeared ; and their lowings had nothing like that of any creature known. In a word, in the whole extent of three hundred leagues from east to west, and more than one hundred and fifty from south to north, the land, the rivers, and the shores of the sea, were, for a long time, by intervals, in such an agitation as the Prophet King represents when he relates the wonders which accompanied the departure from Egypt of the people of God. The effects of this earthquake were

infinitely varied ; and never, perhaps, was there more cause to think that nature was to be destroyed, and the world coming to an end.

“The first shock lasted half an hour, without cessation ; but, at the end of a quarter of an hour, it began to be less violent. The same day, at eight o'clock in the evening, there was a second shock, as violent as the first ; and, in the space of a half-hour, there were two others. Some persons counted thirty-two in the following night, some of which were very strong. * * * *

“Half way from Tadoussac to Quebec two mountains were levelled, and of the earth which was thrown down by them, a point was formed, which was advanced a half-quarter of a league into the river.”

These several voyages of Hennepin, La Sale, and Lahontan, had made the world acquainted with the noble Mississippi from St. Anthony's to the Gulf, and with the St. Peter's, and Missouri, and Wisconsin, and Illinois, and with a vast extent of territory, containing the richest soil upon the earth, and some of the richest deposits of metals within it.

The dominion of the French in America had been extended by the discovery and acquisition of all that territory lying west of the Lake Michigan to the River Mississippi, and of the much greater and more magnificent region comprehended under the name of Louisiana : embracing all that country which it is within the scope of this work to describe. Lahontan, it should be named, took formal possession of country of St. Peter's, by setting up landmarks of his trade and Louisiana included the Missouri River, of which it ^{the} not appear that the French gained any jurisdiction * the visit beyond what might be claimed by the right of di ^{Missi,} Lake ^{he same} merely.

The earliest visitors to Lake Superior had b

quainted with its rich deposits of copper ore. More than one of the published descriptions mention it, and it is stated by Charlevoix that such was the purity of the ore that one of the monks who was there, and who had been bred to the business of a goldsmith, made from it some sacramental articles

"The savages," says Charlevoix, "on account of the quantity of fish furnished by Lake Superior, and of the respect inspired by its vast extent, have made it a sort of divinity, and offer to it sacrifices in their manner." He thinks, nevertheless, it is rather to the genius of the lake than to the lake itself that they address their prayers. "If one may believe them," says he, "the origin of the lake has something divine in it. It was formed, they imagine, by Michabou, the god of waters, in order to supply them with beaver. In the strait by which it is discharged into Huron, there is a rapid, caused," he says, "by great rocks, called Sault St. Marie. These rocks, according to the Indians, are the remains of a causeway which God had built to hold the waters of the river and those of Lake Alimepegon, which filled this great lake."

"In places on its borders, and about some of its islands," says the writer above-named, "we found large pieces of copper, which are yet the object of the superstitious adoration of the savages. They regard them with veneration as a present from the gods who inhabit the waters. They collect the smallest fragments of it, and preserve them with care, but make no use of them. They say that formerly they have seen a large rock, all of the same mineral, raised much above the water; and, as it is not now to be seen, they say that the gods have removed it somewhere else. But there is reason to suppose that in the lapse of time the waves of the lake have covered it with sand and ooze: and it is certain that we discovered in many places a large quantity of this metal without even being obliged to dig much. On my first voyage

to this country I knew a brother of our order who was a goldsmith by trade, who, while on his mission at Sault Ste. Marie, had gone in search of it, and had made chandeliers, crosses, and censors of it; for the copper is often almost wholly pure."

The savages supposed that when Michebou formed Lake Superior, he dwelt at Missi-Mackinac,* where he was born. This name is properly that of a small island, nearly round and very high, situated at the extremity of Lake Huron, and it has become extended by custom to all the country about. The island may be three or four miles in circuit, and may be seen at twelve miles distance. There are two other islands at the south, the most distant of which is five or six leagues long, the other is very small, and perfectly round. Both are well wooded, and the soil is very good, while that of Missi-mackinac is but a sterile rock, and scantily covered with a little moss and grass. It is, however, one of the most celebrated spots in Canada; and it was a long time, according to some old Indian traditions, the head-quarters of a nation which bears the same name, and which counted, they say, thirty bands, scattered over the neighboring country. It is said that the Iroquois destroyed them, but it is not said at what time, or on what occasion. It is certain that no vestige of them remains: but I have read somewhere that our early missionaries have seen some remnants of them.

This is the account given by Charlevoix, and he adds that the name signifies much turtle.

* This name means much turtle, and the first part is the same as the first part of Missi-sippi, *i.e.*, much water, or great river. The French travellers called it Michasippi, and Michilimackinac. Perhaps also the word Michebou is corrupted in the same way. Miche is probably Missi, great, and the whole word, Great Spirit. The name of the Great Lake also before spoken of is given Michinippi. It should be Missi—the same word again

Mr. D. Iberville, who had the commission of the French king for that purpose, found the mouth of the Mississippi in March, 1700, and ascended the stream some distance. He deputed his father, Mr. Le Sueur, with twenty men, to make an establishment in the country of the Sioux, and to take possession of a mine of copper on the Green River (now called Blue Earth), which puts into St. Peter's on the left, at 40 leagues above the mouth. Le Sueur could not ascend the Green River on account of the ice, though it was in September, and was obliged to build a fort, and winter there. As soon as the season would permit, in April, he visited the mine, and in twenty-two days drew from it more than thirty thousand pounds weight of the mineral. He selected four thousand of that which appeared best, and carried it with him to France.—(*Charl.*, v. 4, p. 165, et seq.)

Mr. Nicollet, who explored that country in 1838, could not find the place referred to, though its situation is very exactly pointed out by Charlevoix.

In 1710, the king granted to Mr. Crozat the exclusive privilege of trading in Louisiana for sixteen years, and the property in himself and his heirs for ever, of the mines, ores and minerals, that might be discovered and worked. In 1717, Crozat surrendered the grant to the king, and he transferred it to the western company, which at this time was formed by Mr. Law. Under the auspices of this company, a German colony was settled a few miles above New Orleans. The company held it until 1731, when it was retroceded to the king. The grant included the country of the Illinois, which was rather indefinite, but probably was intended to include all the country in the Mississippi Valley that had been visited by the French, which would extend north to the territory of the English settlements in Hudson's Bay, and west as far as the country was then known.

This country, whose discovery and occupation has been chronicled in the foregoing very concise epitome, comprises about three-fourths of a million of square miles in extent, mostly of a soil that has not its equal on the earth, and covers nearly in latitude the whole of the northern temperate zone. Its features are peculiar. Most conveniently and beautifully distributed in grove and prairie, the settler finds the labor of subduing it but the sport of a season ; fertile as the chemistry of nature can produce, the husbandman almost forgets he is subject to the law laid upon his first parent, and is scarcely conscious that in the sweat of his brow he earns his bread. It is not more beautiful to the sense, than grateful to the toil, of man.

In the enterprises, humble in means and in the mode of prosecuting them, silent, unapplauded, hazardous and toilsome, great in their results, a few brave and polite Frenchmen, accompanied by two or three pious, peaceful and zealous disciples of the cross, surmounted with comparative ease and impunity, obstacles which, to explorers of different material, would have presented pictures of blood and death. The acquisition of this invaluable country was made by them almost without disaster, which, if attempted by others, would probably have made our peaceful story a series of most moving tragedies. The Frenchman forgets not that the uncivilized, as well as civilized man, is his brother, and he deports himself as man to man. The sturdy Saxon treats the Indian like a dog. The Frenchman adapts himself to all situations, and to all people. The American thinks everything is to be accommodated to him. But the churchmen were also greatly useful in inspiring the savages with peaceful emotions, by their religious emblems, services, devotions and instructions. By these means, and by such deportment, aided by a few presents judiciously bestowed, and with such

influence superadded, as the possession of their formidable fire arms, mostly unknown to the natives, gave them, they were enabled to conciliate the untamed children of the forest and prairie, and to avoid many encounters which a more rude and inconsiderate treatment of the savages would doubtless have provoked.

In 1720, a colony of Germans made a settlement on the banks of the river, a few miles above New Orleans. They were quite numerous, amounting to 1500. In 1723, some Capuchin, and, in two years after, some Jesuit missionaries, settled in the country. For nearly a century following this time, the country was peopled with very few inhabitants, and the events that occurred were few; and saving the treaties by which the political relations of the country were changed, and the dominion successively transferred from France to Spain and England, and afterwards to the United States, are of little interest. In this period, however, that is, in fifty years succeeding the building of Fort Crevecoeur, and the first establishment of the French in that quarter, several settlements were made on the American bottom, a few miles below the mouth of the Illinois. These were at Kaskaskia, Kahokia, and Prairie du Rocher, a few miles north of the others. A settlement was also made at Vincennes, on the Wabash, originally called St. Vincent's; and several points on the Mississippi were visited by them, as the river Des Moines, Prairie du Chien, Prairie Pomme de Terre, Marais d'Osier (Willow Swamp), now corrupted into Meredosia Swamp, and other places.

In 1729 there was a conspiracy of the Natches Indians against the French residing at Fort Natches, which, by the incredulity, blindness and obstinacy of the commander, Chepar, who had full notice of the conspiracy, which his rapacity and misrule had caused, resulted in the massacre of 2000

settlers, with circumstances of the most revolting barbarity, and the captivity of a great number more. In 1752 one of those hostile irruptions, so common among the savages of this continent, took place between the Outagamis and Mitchigamis, which is thus related by Bossu, a French traveller, who was in the country at the time :—

“In 1752, the Kahokias met six Outagamis hunting. They took them prisoners, and burned them. One of the Outagamis escaped, however, from the stake, and having returned to his nation, related to them what had been done to his companions. The chief of the nation called an assembly, in which it was resolved to send bundles of rods to mark the number of warriors and the day of departure to their allies, the Sioux, Sakis and Kikapoos, who went with the Outagamis to the number of 1000, to revenge the death of their brothers who had been burned by the Kahokias. They embarked in 180 canoes on the river Wisconsin, and descending that stream and the Mississippi, landed near a village of the Michigamis or Missigamis, below the Fort of Kahokia, with which tribe it appears the Kahokias, who had burned their countrymen, were domesticated. The commander of the allied invaders ordered ten or twelve of the best runners to throw themselves into the village, which was immediately done. They fell upon the enemy's village, and killed all they met, sounding the death cry, and having discharged their arms fled with great speed. The Missigamis pursued. The Outagamis and their allies lying concealed in the tall grass, discharged their arrows at the approaching foe, by which twenty-eight were killed, and immediately fell upon the village, and killed men, women, and children, set fire to the village, and led away captives those who were not slaughtered. This battle took place on the 6th of June, 1752. The Outagamis lost four men : the Missigamis, in killed and

prisoners, about eighty. The allies, content with their revenge, re-embarked with their prisoners, and returned to their own country.—*Bossu*, i., p. 129, et seq.

In 1762, France, by a secret treaty, ceded Louisiana to Spain, to prevent it from falling into the hands of the English, with Canada, which it now became manifest must become the property of the latter nation by conquest, and which was actually given up to the English in the following year (1763), by the treaty of Paris. Twenty years afterward, by the treaty of peace between England and the United States, that part of Canada lying south and west of the great lakes, and comprehending a large territory which is the subject of these sketches, was acknowledged to be a portion of the United States; and twenty years still later (in 1803), Louisiana was ceded by Spain back to France, and by France sold to the United States.

In 1763, Mr. Laclède, who, in the preceding year, had received a charter to trade with the Indians, from the French governor at New Orleans, ascended the river, leaving New Orleans in August, and, on the third of November, arrived at St. Genevieve; and, in the following spring, with thirty others, on account of insufficient accommodation at St. Genevieve, passed over the river to Fort Chartres, a post established by the French in 1732.

In the half century from the building of the fort of Creve-cœur, 1680, up to the period of that of Fort Chartres, many French settlements had been made in that quarter. The principal were St. Vincent's, on the Wabash, and Kaskaskia, Kahokia, and Prairie du Rocher, on the American Bottom, a large tract of river alluvion in Illinois, on the Mississippi, opposite to St. Louis. But here, being informed that all the Illinois had been given up to Great Britain, they crossed the river, and established themselves at St. Louis, on the right

bank. Many of the French in the settlement just named followed them, others went to New Orleans, and those places became nearly abandoned.—*Nic.*, pp. 75, 77.

Some of these people, however, especially those from Fort Chartres and Prairie du Rocher, who went to New Orleans, finding Louisiana transferred to Spain, returned to Illinois.—*Ib.*, 79.

One of the most remarkable occurrences belonging to the history of the Upper Mississippi happened at this period, in consequence of the change of dominion over the Illinois country. The Indians, having become attached to the French, refused to acknowledge the sway of the power to whom the latter had surrendered the country. This event is thus related by Nicollet:—

“In the meanwhile, the second year after the treaty of peace had elapsed, and the British had not yet been able to take possession of Illinois. This was owing to the opposition made by several Indian tribes, who, as alluded to above, had refused to abide by the treaty, and were waging a most cruel war against the British. These tribes had formed a confederacy, under the command of Pontiac, a bold warrior, who had already become celebrated for his prowess, and his devoted attachment to France during the whole of the war which the latter had carried on against Great Britain in America. The confederated Indian army was composed of Hurons, Miamis, Chippeways, Ottawas, Pottawatomies, Missouriias, &c. The name of Pontiac was the terror of the whole region of the lakes; and, by his bands, he effectually interrupted the British intercourse with the rest of the nations that had remained friendly to that government. The taking of Fort Michilimackinac, the attempt at Detroit, and the attack upon the schooner Gladwin, on Lake Michigan, are

memorable events, evincing a spirit of cunning and daring highly characteristic of the genius of the red man.

"In the winter of 1764-65, Pontiac, whilst engaged in his acts of depredation, learned that an armed British force was about to start from New Orleans, to take possession of the left bank of the Mississippi. He immediately proceeded to the neighborhood of Fort Chartres, accompanied by four hundred warriors, to oppose this occupation of the country; and, finding there some Illinois Indians who had placed themselves under the protection of the French garrison, he proposed to them to join him. But these people, disheartened by recent calamities, and, as it were, foredoomed to a final extinction, were unwilling to assume a hostile attitude towards their new rulers, from whom interest, if not generosity, would lead them to expect the same protection which they were then receiving. To this refusal, Pontiac replied with characteristic energy: 'Hesitate not, or I will destroy you with the same rapidity that fire destroys the grass of the prairie. Listen, and recollect that these are Pontiac's words.' Having then despatched scouts upon the Mississippi and the Ohio, he hastened with some of his warriors to Fort Chartres."—*Nic.*, p. 80.

He here had an interview with the French commander, professed his friendship for the French, and offered his services in resisting the English in attempting to take possession of the country. His offers were rejected, of course; and, after a short time, he returned to the north, made peace with the British, and received a pension from them.—*Ib.*, p. 81.

Pontiac afterward resided at St. Louis; and, on a visit to the Kaskaskia Indians, was made drunk, and, while in that state, was murdered by a Kaskaskia Indian, hired, it is said, by an Englishman, named Williamson. This murder roused the vengeance of his friends, and brought on wars which

resulted in the almost total extinction of the Illinois nations, —*Nic.*, 81, 82.

Pontiac was a remarkably good-looking man ; nice in his person, and distinguished by taste in his dress. His complexion was very light, approaching that of the whites. His origin is uncertain. Some suppose him to have been an Ottawa, others a Miami ; but, on the best authority, he is stated to have been a Nipissing.—*Ib.*, p. 82.

The rapid extermination of the Illinois nations of Indians affords a vivid illustration of the warlike tastes, the litigious disposition, and of the habits of the northern Indians, as well as a sad moral lesson on the decay and extinction of races and nations.

At the time when La Sale undertook his great project of the discovery of the Mississippi, in 1679, the Illinois were a populous and powerful nation. They had, at that time, suffered greatly in the recent and long-continued warfare with their eastern neighbors; the Iroquois, which had not yet terminated. The accounts given at that time represented that one village on the Illinois river contained, conjecturally, ten thousand. Charlevoix mentions only four bands : the Tamaroas, at the mouth of the Missouri ; the Moingonas, at the Des Moins River, as now called ; the Kaskaskias and Kaokias, upon and south of the Illinois river. The Michigamis and Peorias were, no doubt (certainly the first), of this nation ; but whether distinct tribes, or divisions of one or more of the other tribes, may be doubtful. The desolating war of the Iroquois gave a severe shock to the Illinois, from which they never recovered. About seventy years after this period, the combined forces of the Sauks, Foxes, Sioux, and Kickapoos, in 1752, made a descent by the river, as already related, upon a village of the Missigamis, and killed a large number ; and, a few years afterward, the murder of Pontiac, a renowned

chief of one of the northern tribes, who appear generally to have acted in concert, by a Kaskaskia, aroused a vengeance of those allies, which was unappeased till scarcely the vestige of this great nation remained. Thus, about a century of savage war exterminated one of the most numerous nations on that part of the continent. At this day, the Kaskaskias and Peorias number, conjointly, about one hundred and fifty persons, which is all that is now to be found of the Illinois nation. It is true that the tribes are not always extinct when the name is lost, and it is quite probable that many hundreds might have escaped the general destruction, who became adopted by their vanquishers, or united with other tribes. These associations are customary among all the Indians; and instances are very common both of a union with other friendly bands, and of adoption of prisoners of war.

On the right bank of the river, at the period of the founding of St. Louis, there were no Indians at that place nor in the whole extent of country south of what is now the southern line of the State. Thus, at the conclusion of the wars following the death of Pontiac, except a portion of the Peoria tribe, who had survived those wars, and who were finally extirpated by the Sacs and Foxes in the beginning of the present century, the southern portions of the country now forming Illinois and Missouri, or that below the Illinois and Missouri Rivers, was uninhabited, except by the few French and those who held the military posts for the English Government.

Carondelet, sometimes called familiarly Vide poches, was settled in 1767. In 1769, Blanchette, the hunter, built his cabin on the bank of the Missouri, the first building of the village now called St. Charles. At the same period Florissant and Portage des Sioux were first inhabited.

In 1780,* a party of British and Indians made an attack

* Nicollet, p. 84.

upon St. Louis, and attempted to take possession of it, in consequence of the friendly disposition of Spain to the revolted colonies. There were but 150 males in the place, while their invaders numbered, according to the various statements, from 900 to 1,500. The inhabitants of both sexes, the women taking a part in the battle, made such a vigorous resistance that the assailants were compelled to retire, after revenging themselves by the death of sixty and the captivity of thirteen of the inhabitants, who were outside of the palisades.

In 1785, called the year of the great flood, the Mississippi rose fifteen or twenty feet higher at St. Louis than ever before known, and at some narrow points on the river, thirty feet. The villages of St. Genevieve, Fort Chartres, Kaskaskia, St. Philippe, and Kahoka were totally submerged. St. Genevieve was at that time situated on a bottom prairie, that has since been entirely washed away.

The winter of 1799 was distinguished for its extreme cold: as had been also the year 1768.

In 1778 a body of Virginia militia, under command of Gen. George Rogers Clarke, made an incursion into the Illinois country, then in possession of the British, and captured Fort Chartres, Kaskaskia, and other neighboring posts on the Mississippi; and St. Vincent's on the Wabash, now known as Vincennes. In the same year the country was organized as a county, by the Legislature of Virginia, called Illinois County. It was subsequently ceded by Virginia to the United States, and in 1787 made a part of the Territory Northwest of the Ohio River. In 1800, on the establishment of a separate territorial government in Indiana, it was included in that government, having, at that period, about 3,000 inhabitants.

In 1803 the United States, by treaty dated April 30th, acquired of France the whole of the vast and beautiful country

known as Louisiana, with the same extent that it formerly had in the hands of France, and that, at the date of the treaty, it had in the hands of Spain.

By act of Congress, of 31st October in the same year, the President of the United States was empowered to take possession of the country ceded, and provision was made for the temporary government thereof.

By act of March 26th, 1804, the country was divided into two territories. The southern was called Orleans, and embraced the country east of the Mississippi River and south of the Territory of Mississippi, and west to the western limit of the purchase. The northern portion, being all the remainder of the country that was purchased by the treaty, was annexed to Indiana as a district by the name of Louisiana. Indiana had been erected into a Territorial Government by act of May 7th, 1800, to take effect on the 4th July following: with all the rights and privileges which, by the ordinance of 1787, for the government of the Territory Northwest of the Ohio, had been secured to the settlers of the northwest. The act of 1804, which annexed Louisiana to Indiana, extended these rights and privileges to that district. The executive power, which was vested in the Governor of Indiana, was extended to the district. The Governor and judges of Indiana were empowered "to establish in the said District of Louisiana inferior courts, and prescribe their jurisdiction and duties; and to make all laws which they may deem conducive to the good government of the inhabitants thereof:" provided, that no law shall be valid which is inconsistent with the constitution and laws of the United States, or which shall lay any person under restraint or disability on account of his religious opinions, profession, or worship, in all of which he shall be free to maintain his own, and not be burdened for those of another." (Sec. 12.) And it was provided, by sec. 13, that

“the laws in force in the said District of Louisiana at the commencement of this act, and not inconsistent with any of the provisions thereof, shall continue in force until altered, modified, or repealed by the Governor and judges of the Indiana territory as aforesaid.” The laws in force at the date of the act were those in force at the time of the cession, and prior thereto, under the governments of France and Spain. This was the body of law known as the civil law,—and the District of Louisiana thus presented the anomaly in law of the common law engrafted upon the civil. These laws, it is believed, have not been repealed; but, by the oversight, probably of the judges and advocates in the courts, no notice has been taken of them, and they have fallen into oblivion, and at this day would perhaps be considered as obsolete. The whole of Upper Louisiana now stands in this singular condition of a country, in which those laws that were not only her birthright, but were expressly saved to her by statute when the common law was added to her code, have become obsolete and lost by the prevalence of the common law, under the administration of judges and practice of courts that were unacquainted with the civil law, and through inadvertence did not consider the force of the statute by which the older was retained.

In 1809 a separate government was established over the Territory, now State, of Illinois, consisting of a governor and judges, who jointly exercised the legislative functions. At that time it contained about 12,000 inhabitants. In 1812, it was allowed a legislature and a delegate in Congress. In 1818 the State Constitution was adopted, and Illinois was admitted into the Union.

At the period of the hostilities between this country and Great Britain, which began in the year 1812, our government had established a military post, and erected a fort, at Chica-

go. This was feebly garrisoned for a short time in the summer of that year. On the 15th of August, 1812, Capt. Heald, in command of this post, having received orders to that effect, prepared to evacuate the fort and to proceed to Detroit by land. Having destroyed that portion of the arms and ammunition that would not be necessary to his march, and could not be conveniently transported, he commenced his march with fifty-four regulars and twelve militia, and accompanied by an escort from Fort Wayne, and a few friendly Miamis. The women and children accompanied the expedition. The party had proceeded only a little over a mile, when they were attacked by a body of hostile Indians. The friendly Indians stood aloof, and Capt. Heald, after a short skirmish, in which all the militia and twenty-six regulars were killed, surrendered on a promise of protection by one of the chiefs. The Indian force amounted to 500, their loss in the battle was fifteen.

At the outbreak of hostilities, the Sac and Fox Indians resided at the country about the mouth of Rock River. They were induced to join the English, and operate with them and their other red allies against the United States. They were present at one or two skirmishes in the neighborhood of the lake, and it is believed that they composed the force, or a part of it, of the attacking party at Chicago. I think this is asserted in a narration of the wars of that tribe, published some years since. But being disgusted, it is said, with the barbarous atrocities of the allied English and red men, they, in a very short time, abandoned the cause, and returned to their country, where they remained quiet during the war.

In 1815, the several tribes of Indians inhabiting the northwest, who had been drawn into hostilities with the United States, by the wiles and gratuities of Great Britain, made

treaties of peace and friendship. The Potawatamis of the river Illinois, the Kickapoos, the Iowas, the Tetons, the Sioux of the lakes, the Sioux of the river St. Peter's, the Piankeshaws, the Chippewa, Ottawa, and Potawatamis, with bands of the Wyandot, Delaware, Seneca, Shawnee and Miami tribes, all of which eight tribes and bands united in one treaty; the Yanktons, the Sacs of the Missouri, the Foxes, the Osages, the Kansas, the Mahas, each came into treaties of amity. The Sacs, of Rock River, were invited by the Commissioners on the part of the United States to enter into treaty at the same time: they declined it at this time, but in the succeeding year, in 1816, they signed articles of a treaty of peace and friendship; and in the same year three other tribes of the Sioux, who are designated as the Sioux of the Leaf, the Sioux of the Broad Leaf, and the Sioux who shoot in the pine tops, also the Winnebagoes of Wisconsin River, and in 1817, the Menominis, Ottos, and Poncaras or Puncas. In 1819, similar treaties were made with the Pani Mahas, the Pitavirate or Noisy Panis, the Pani Republic, and the Grand Panis.

In 1816, the united tribes of Ottawas, Chippewas and Potawatamis, residing on the Illinois and Milwaki Rivers, and the southwestern parts of Lake Michigan, relinquished their right to the lands ceded by the Sacs and Foxes in 1804, lying south of a due west line from the southern extremity of Lake Michigan to the Mississippi, and also ceded a tract beginning on the left bank of the Fox River of Illinois, ten miles above the mouth of said Fox River, and extending to Lake Michigan, lying on both sides of the Des Plaines about equally, and in its whole width twenty miles.

In 1818 Illinois was admitted into the Union as a State, and Missouri in 1821.

After the organization of the state government in Illinois,

the population increased rapidly, and pressed upon the Indian territories and settlements. Jealousies arose, aggressions took place, irritations were created, on both sides. In 1827, the Indians attacked two keel-boats which were transporting military stores to Fort Snelling, and killed two of their men, and wounded others. General Atkinson, thereupon, marched into the Winnebago country, and brought in Red Bird, a chief, and six others, who were held in confinement for trial. Red Bird died in prison. The others were tried, and a part of them convicted, and executed in December, 1828. Black Hawk, a Sac chief, whose Indian name was Muckatai-mishakiahkiah, was one of those imprisoned, but he was acquitted for want of proof. It is said that he afterward confessed his participation. His long imprisonment increased his former irritation. It had inflicted a rankling wound, which the blood of the Americans alone could cure. In 1830, a treaty was made by the Sacs and Foxes, and other tribes, with the American government, in which they ceded all their lands east of the Mississippi. Black Hawk dissented, refused to leave the ceded country, and was supported by a party of the Sacs. Having received personal abuse and insult, it is said, from the whites, instigated by his opposition to the treaty, and a desire to retain his old home ; irritated by personal indignities, and being promised the aid of the Chippewas, Ottawas, Potawatamis, and Winnebagoes, and informed, also, that the British were ready to help him, he commenced hostilities. Previously, however, it is said, he proposed a compromise with Keokuk, the head of the treaty party, and offered to give up the mineral region on the promise of Keokuk that he would endeavor to have the Rock River peninsula, where they had long resided and cultivated, and where they had buried their fathers, restored to them. In expectation that this arrangement would be made, they

went on their winter hunt in 1830 ; and on their return, in the spring of 1831, found their village and country in possession of the whites. On the appearance of the United States troops, Black Hawk and party, who had previously refused to leave their lands, fled across the river. In 1832, they re-crossed, when a brigade of one thousand mounted volunteers was organized, armed, and equipped, and immediately marched to Rock Island, where they found General Atkinson, with four hundred regulars and a small body of militia. General Whitesides, the commander of the volunteer corps, marched up Rock River, and burned the prophet's town, a village of the Indians ; and this must be considered the commencement of formal hostilities. Upon Rock River they found another small band of volunteers, under Major Stillman. This last band, having undertaken a scouting expedition to the distance of thirty miles north of Dixon's Ferry, unexpectedly met a party of Black Hawk's men in ambush, and immediately took to a precipitate and disorderly flight. Their commander ordered them to retreat to the high ground and make a stand ; but so terror-stricken were they, that they forgot the latter part of their order till they had reached their head-quarters at the river. This rout still furnishes the subject of many a quip and piece of merriment at the expense of those who were engaged. It is supposed the Indian force was about seventy. This was on the 14th of May. On the 24th of June, a party of the militia, said to be about one hundred and fifty, on their march to Galena, were met by a superior number of Indians, about two hundred, and, after a severe contest, retired into their blockhouse. On the 21st of July, a general engagement took place, near the Wisconsin, between General Henry's brigade of militia and the whole Sac force. Black Hawk was driven from the field, leaving sixty-two of his men dead. General Henry's brigade

went in pursuit, and, on the next day, reached the Blue Mounds ; and being rejoined by General Atkinson and the regular troops, and the other brigades, the whole force arrived at Helena, on the Wisconsin, on the 26th. On the 2d of August they overtook Black Hawk near the Bad Axe, and again defeated him in a decisive action. The American force consisted of four hundred regulars and parts of Henry's, Posey's and Alexander's brigades of militia, in the whole 1300 men. General Atkinson, in his account of these engagements, states that the Indian loss, in both, was three hundred. He returns only eighteen killed, and four wounded, of his own men, at Bad Axe ; and states the Indian loss at one hundred and fifty killed, and thirty-five captured. Black Hawk himself escaped ; but, about three weeks afterward, was brought into the camp a prisoner by some Winnebagoes. Thus ended the three months' movement, commonly called the Black Hawk war. It was succeeded immediately by a cession of a strip of country on the west of the Mississippi, fifty miles wide, extending north from Missouri to the neutral ground, in a treaty concluded by General Scott in September of the same year ; and, in the summer of 1833, the settlement of Iowa by the white man was commenced. Two small strips were successively purchased in 1836 and 1837 ; and, in 1842, a vast tract, estimated to contain about 23,000 square miles, or 15,000,000 acres, centrally situated between the two great rivers, was added to the former purchases.

On the 1st of August, 1829, by a treaty with the Winnebagoes, the United States acquired a large tract, beginning at the mouth of the Pee-keetanon, or Pectanon, and following up that river and the Sugar Creek branch, and across northwardly to Fox River, and down the Wisconsin to the mouth, and southerly from thence to Rock River, at a point forty miles from its mouth, and up that river to Pectanon. A large

and valuable tract of about one hundred miles, north and south; and, on its greatest extent, east and west, about the same, being 6000 or 7000 square miles.

And, on the 29th of July, same year, another large tract, between Rock River and Lake Michigan, and a strip on the Mississippi, from Rock River to the reservation on the Wisconsin, was ceded by the Chippewas, Ottawas, and Potawatamis, which cessions included nearly all the land between Lake Michigan and the Mississippi, and between Rock River and Wisconsin.

By a treaty, made the 15th of July, 1830, a tract of twenty miles in width, extending from the Mississippi to the Des Moines, was ceded by the Sacs and Foxes; and another similar tract adjoining it on the north, by the Sioux. Its southern line, on the Mississippi, is near the Wisconsin.

On the 8th of February, 1831, the Menominis ceded a tract lying between Winnebago Lake, Fox River, and Green Bay, on the north, and Milwaukee River, south, and Lake Michigan, east. And in October, 1832, the Potawatamis ceded their land lying between Chicago River and Kanakee, and the Fox of Illinois.

In September, 1832, the Winnebagoes ceded the land lying on the west of the Rock River, above the Pectanon branch, to Lake Puckaway, and bounded west by their cession of August, 1829.

In 1836, Michigan was made a sovereign state, and admitted into the Union. A new territorial government was, at the same time, organized over Wisconsin, which included all the Black Hawk purchase, and extended west to the Missouri River. In 1838, a new territorial government was established over that portion of Wisconsin which lay west of the Mississippi, called Iowa. In the five years intermediate between the departure of the Sacs and Foxes, in the summer

of 1833, and the establishment of the territorial government in 1838, the Black Hawk Purchase had gathered a white population of 22,000. In 1840, at the taking of the census, in June, it contained 43,000. It is supposed that the usual annual increase by emigration since that time has been about the same, or something near ten thousand yearly ; and, with a sufficient allowance for an augmented natural increase, in proportion to the greatly augmented basis, the whole yearly addition to the population cannot be less than 12,000, or, for the six years, to June, 1846, 72,000 ; which, added to the 43,000, makes the whole 115,000. This is believed to be under the true amount, as, in 1843, and the spring of 1846, an unusual impulse was given to emigration by the acquisition of new territory, and the allowance for natural increase is made very small. It is more probable that the whole actual population at this time (July 4, 1846) is 150,000.

Wisconsin, as constituted by the division into two territories, had, at that time, July, 1838, 21,000 inhabitants. By the census of 1840, it had 34,000. Its increase in the two intermediate years had been much less than that of Iowa, but in some subsequent periods it has been very great ; and it contains, by a recent census, about 160,000. The least total amount that can be assigned to the two territories is little more than 300,000, at this time.

Acts have passed Congress, in June and August, 1846, for admitting both territories into the Union with the attributes of sovereignty. They will probably be adopted by the people ; and, in the present year, two new and bright stars will be added to the Union.

At the moment that Congress was acting upon the admission of Iowa and Wisconsin into the Union, a treaty was in progress, and is now completed, by which the Potawatamis have ceded their lands lying east of the Mississippi, Missouri,

and between the Sioux and the Missouri State north line. The tract contains 6000 or 7000 square miles. The Indians have stipulated to remove in two years. By this cession, the Indian title has become extinct in the whole tract between the Mississippi and Missouri Rivers. The Sioux hold a strip on the northern frontier of the new state, which is the only Indian country, except the neutral ground, now within the limits fixed by Congress for the State boundary.

The authorities relied upon for the foregoing statements are, Gabriel Sagard, Hennepin, Lahontan, Charlevoix, *Histoire Gen. des Voyages*, Paris, 1757; Bossu, Lockman, Churchill, Heriot's *Hist. Canada*, Pike, Schoolcraft, Nicollet, Long, *Laws of Congress*, Public Documents, &c.

PART III.

POPULATION—POLITICAL SYSTEM—CIVIL DIVISIONS— MUNICIPALITIES—TOPOGRAPHY.

THE population of this region, at the present time, exceeds by computation, 750,000 ;* viz.—in Illinois, north of the Illinois River, about 240,000 ; in Missouri, north of the Missouri River, about 240,000 ; in Wisconsin, about 160,000 ; in Iowa, probably exceeding 120,000. This multitude has nearly all been planted on the territory within twenty years, mostly indeed within fifteen, excepting a few scattered settlers on the Illinois and Mississippi and Missouri Rivers. Galena was settled in 1828. They are from all States of the Union, from Germany, Ireland, England, Scotland and Canada. There are a considerable number of Franco-American families from Canada and from the early French colonies in the Mississippi valley ; and it is as common to hear a certain uncouth French dialect, known in that country under the name of Gumbo French (a term applied both to the people and the dialect), jabbered in the streets of

* By the census of 1840, Northern Missouri contained 160,821 ; Northern Illinois, including counties that lay across the Illinois River, 160,755 ; Iowa, 43,000 ; Wisconsin, 30,000 ; total 393,000. I have added 50 per cent. to Missouri and Illinois. Iowa has increased at the rate of about 12,000 per year, which would be 115,000. Wisconsin, by a census just taken, is found to have 155,000, and three counties not returned.

Dubuque, as it is to hear English spoken there. The greater part of this population between Illinois and Rock Rivers, and between the Missouri and Iowa Rivers, comprising a district of some two hundred miles in width from north to south, in the centre, but narrowing toward the extremities, is from the Ohio Valley and the South. Pennsylvania and Virginia, west of the Alleghany, Ohio, Kentucky, Indiana, Tennessee and North Carolina, have sent their colonists to these latitudes. North of these lines the larger portion is from the Northern States, east of the mountains, and from Europe. They are, many of them, men who have not derived much knowledge from education, but have been schooled only in the world, and learned in the knowledge of men. They have shaken hands with privations and hardships, and with luxury have but little acquaintance. There are, however, many well informed, of the softer as well as of the rougher sex, living in the homeliest style of rustic life.

Iowa is divided into 39 Counties, 25 of which are organized,—and into townships of greater or less extent according to population, but generally comprehending more than one geographical township, into which the whole country is first divided by the government surveys. Other portions, where the population is concentrated at particular points, are incorporated into towns or cities. Between these two last, there is very little difference in substance, if any. The municipal authorities have in each very similar powers. In the towns, affairs are managed by a single board called trustees, and in the other, in the more usual form of Mayor and Aldermen. In either case the municipal government has the power to assess and levy the taxes, to ordain the by-laws, and to appoint the officers. In the townships, as politically established, the government is in the hands of inspectors. But even in these smaller depositories of power the differ-

ence consists more in the actual exercise than in legal gradation. The power to be exerted is little else than appointment of minor officers. Those little democracies, erected in some of the States under the name of towns, where all the powers of the local government are exercised by a vote of the people, are wholly unknown here.

Lee county is situated in the point between the Rivers Mississippi and Des Moines. It is very thickly populated, notwithstanding a large portion of its lands were reserved to the Half Breeds of the Sac and Fox Indians, and there was consequently a difficulty in obtaining title. This difficulty has been overcome by purchase and partition, and the settlers now are owners of the soil. The Des Moines Rapids extend over a greater part of the Mississippi boundary, upon which are situated several towns which promise to be among the flourishing places of the State. Keokuck is below the rapids. It is seated on the bluff, which here comes quite to the river, and by its steep and high ascent, makes a very inconvenient site for a town. But the advantage of its situation overcomes this unkindness of its topographical character, and being at the mouth of the Des Moines, and at the foot of the lower rapids, at the point where both the obstructions of rock and ice begin, and having a good landing, it must of necessity have both a rapid and a solid progress. Nashville, on the rapids, has a better situation, though this also is built on rather a steep ascent. Montrose, at the head of the rapids, the site of old Fort Des Moines, is situated on a low ground, in a wide part of the river opposite the Mormon town, Nauvoo. Here there is a broad and handsome plat sufficient for a large city. The town has a very slow progress, and will not keep pace with some others on the river. Fort Madison is the most populous town in the county, situated about twelve miles above the head of the rapids,

on the Mississippi, on one of the finest town sites in that part of the river. It is an elevated bank, twenty feet or more above the water mark, forming nearly a level of sufficient extent for a city of the largest class. Its soil is sandy, and from its relations with the river must be very healthy. It has at present, by estimation, from twelve to fifteen hundred inhabitants. There are some interior flourishing villages in this county.

Des Moines is next on the river, extending from the Chekakwe or Checaqua River, nearly to the Iowa. Its river boundary is not so good as that of Lee county, the bank being, for the greater part, a low bottom, and presenting only one favorable site for a town, which is at the mouth of Shokokon or Flint Creek, at a bluff called by the Indians, Shokokon, from the abundance of chert found on the surface, and by the Whites, Flint Hills. The Indian appellation or mineral feature to which it was owing, should have furnished a name to the modern town : and Chertburg, or Shokokon, would have as good sound, and more sense, than the threadbare Burlington. The place is partly on the irregular edge of a bluff, and partly on a low bottom, being an inconvenient place for a town ; but having had a great impulsion at first from the location of the land sales there, and the temporary seat of government also, it made a progress, which, backed by a very populous interior behind it, and having a good landing, has been more rapid than any other place, and it is now beyond all other towns in the Territory in population, in trade, in prosperity and wealth. The number of its inhabitants is exceeding two thousand. The county of Des Moines is the third in population, Van Buren and Lee being first and second. The three counties have probably not much less than 40,000 inhabitants, which is very nearly equally divided. The land of Des Moines county is good ; there being little difference in quality throughout this Territory. Being, how-

ever, of rather a large proportion of clay, and of rather a level surface, it is not ready for the plough so early as some lands further north. Augusta is a small village on Skunk River, about eight or ten miles from Burlington. New London, Franklin, and other small villages, are scattered upon the prairie, in this county.

Louisa is a very small county on the river, next above Des Moines. Wapello, on the Iowa River, is the capital. It has two or three other small villages, but is principally remarkable for having formerly had an Indian town, the residence of Black Hawk, within it, and the river Iowa running through it. A part of the large island, called by the Indians Mascotin (Prairie Island), is in this county. The word, by a natural metamorphosis, has been called by the French Muscodin and Muscatine, and under that change has given name to the slough or branch of the river that divides it from the main, and to the county at its upper end, adjoining Louisa. This island presents a singular feature in the topography of this part of the river. It is nearly twenty miles from north to south, and about half of that extent in the other direction, and is a bottom prairie, but little elevated above the river, and nearly a mechanical level. It is made by a small portion of the river which passes around it, joining the main stream again, after a course of twenty-five or thirty miles, a short distance above the Iowa River mouth. The upper end of the island is about twenty-five miles below the mouth of Rock River, and nearly the same above the mouth of Iowa.

Muscatine county, beginning on the island, and extending some sixteen or eighteen miles above it, is well watered, having the Red Cedar traversing it from north to south, at ten or twelve miles from the Mississippi, in nearly a parallel direction, and the Wapsinonoc Creek farther west, a tributary of

Cedar. This is a well settled county. North of the Iowa River the soil loses some of its alumine, with which it was rather surcharged in Des Moines, and becomes more mellow by an admixture of sand, which is probably silico-cretaceous. The surface also becomes more undulating, and the union of these two conditions overcomes a degree, more or less, of latitude, and the season for beginning cultivation is, therefore, about the same in this distance. Apart from this consideration, I think the change is for the better in regard to fertility, and that the tract of country between the Iowa and the Maquoketa, or Makwaketa, is perhaps rather the best on the river in this point. It is, however, inferior in another, hardly of less importance to the farmer, that is, in the quantity of timber. With this article the region now under our observation is rather scantily supplied. Bloomington is the county seat of Muscatine county. There are a few small villages beside, Moscow on the Cedar, and Salem and Wyoming on the Mississippi. The City of Ellenborough, a mere embryo with a sounding name and a most ample charter, has been projected, and having a good site, may at some day exchange its embryo for an actual existence. Bloomington is a place of much business. It has one of the best positions, geographically, in the territory, and is one of the most important towns. Its population probably is nearly 1500. It has the disadvantage of a bad site, both local and relative, it being on a steep bluff, and in the immediate vicinity of Mascotin Island and Slough above mentioned, which last is apt to be a cause of disease.

The region above Muscatine county, as far as Maquoketa River, including Scott and Clinton counties, and part of Jackson, is very scantily supplied with timber. It is highly fertile, however, and a handsome country. The banks of the river, on both sides, from Bloomington to the Wabesepinecon,

are the most beautiful on the River from the mouth to this point; and on the west side, the whole line, for a distance of nearly forty miles, from Bloomington to Spencer's Creek, would make one continuous city site. Davenport, in Scott county, about thirty miles above Bloomington, is on a most beautiful inclined plane, almost of a mathematical exactness, of a very slight inclination, only sufficient to be perceived by the eye, and to shed the waters. It is sufficiently sandy to become dry immediately after a rain. This plane extends back about half a mile, from the river to the bluff. The banks on both sides are high and dry; and immediately fronting Davenport is the town of Rock Island on the Illinois side. The river is little more than half a mile wide. Immediately above the two towns is the island of Rock Island, having a rock foundation: a very unusual character, the islands generally, in this river, being alluvial. The scenery at this point is very beautiful—said to excel, in this particular, any spot below Lake Pepin.

Some individuals have taken advantage of the division of the river into two streams, at this point, to appropriate the narrow portion passing between the Island and the Illinois shore to milling purposes. By running a dam across at the head of the island—which, by reason of the very little depth of the water, and a rock bottom, they were able to do at a very trifling expense—they have availed of this immense body of water, being about one-third of the whole volume of the river, and with a head of five feet. Beside this, there are several other points upon these rapids, where equal advantage may be made of the river in this way. And at a time not remote, this will become a principal grain market for the country around, and a place of great industrial activity. Rockingham is a small village four miles below Davenport, opposite the mouth of the Rock River. At the purchase of the territory

by our government, the Indians reserved a tract of one mile square at the head of the rapids, and a similar tract at the foot, for Mr. Antoine Leclaire their interpreter. On the lower reservation is the town of Davenport, and it is intended to have another town on the upper tract. Adjoining the upper reservation, above it, is the little village of Berlin. Fifteen miles further up the stream is another, Camanche. This last is in Clinton county. Fifteen miles to the west of this last a town has been laid out for the county seat of the county. It is called De Witt. The site is in a handsome prairie, having groves upon three sides, at a distance of from one to three miles, and to the northward open to a much greater distance. There are many eligible spots for settlement in this as well as in Scott and all the northern river counties. The settlements have been made lower on the stream, and have progressed westward a hundred miles from the river, while these fine lands have been passed over from a dislike to go so far north,—a very insufficient consideration to place in the balance against contiguity to the river; which, furnishing a great channel for transportation, must always make a difference in the price of produce in the river counties by no means to be overlooked: while the difference in temperature is so slight that neither man nor beast is sensible of it, and the feeding season would not be more than a week or two, at most, longer in these counties than in the lower counties of the territory. Lyons is a busy little village, well situated on the river, in this county, about ten miles above Camanche. At this point begins a change in the topography of the land adjacent to the river. The road from Lyons to Charleston, about twenty miles above, in Jackson county, is over a very rough, broken country, very little of which, in a distance of three or four miles from the river, is favorable to cultivation. It is generally covered with timber. The land, however, at

a few miles back is very good ; and a man who wishes to see the handsomest timber in the territory, must go to the forks of the Maquoketa or Makwaketa ; and upon its south fork are some of the finest prairie and prairie farms. The northern part of Jackson county, between this river and Dubuque, is generally well-timbered and well-watered, and is a very inviting tract for settlement. This is also one of the best watered tracts in the territory. Makwaketa River, Têtes des Morts, Deep, Brush, and Bear Creek, and smaller streams, drain the country—some of them having fine water power. Twenty-two miles above Charleston is Bellevue, also in this county, situated on a fine plateau, well elevated above the river. Andrew, in the centre of the county, is laid out for the county seat. Between the Wabesepinicon and Makwaketa Rivers, is a region furnished very abundantly with iron. At Bellevue, a striking change takes place in the geological formation; the line of the lead mineral commencing here, and passing up to the northwest through the counties of Dubuque and part of Clayton, and thence east into Wisconsin, defines perhaps the richest lead deposit in the world. It is of the kind called Galena, or sulphuret of lead. The river marks a remarkable division in the character of the “diggings,” those on the east side being clay “diggings,” in which the mineral is found in the clay, within a few feet of the surface, while on the west side the miner is obliged to sink his shaft through the rock more than one hundred feet. It is thought, however, that the greater abundance of the mineral in the rock deposit is more than a counterbalance to the case of obtaining it in the clay.

Dubuque, situated in a bay of the river, upon a sandy alluvion, in the centre of these “diggings,” is the second town in the territory in population and business. The rough character of the country upon the river bank, which, as

already said, commences near Lyons, continues through this county, and as far north as the settled parts of the territory. At the neighborhood of Dubuque, it extends six or seven miles. Much of the land near the river is unsuited to cultivation, in consequence of this unevenness of surface. There is, however, much excellent farming land in this and in Clayton county. Some of the Turkey River country is very handsome.

Van Buren county, situated on the Des Moines River, back of Lee, is the best interior county, and by many is considered the best county in the Territory. It is the most populous. The lands generally upon this river have been already mentioned as exceedingly fertile and beautiful. There is an abundance of good coal here. Keosauqua is the capital town, situated in the bend, which the Indians call Keosauqua (or Kebesaqua, as Gen. Pike and Major Marston have it) peninsula.* There are several other towns in this county, populous and thriving. The other interior counties of the old purchase, Henry, Jefferson, Washington, Johnson, Cedar, Linn, Jones and Delaware, are of as good land as the front tier. Linn county has been said to excel all the others, in the more just proportion of timber and prairie land, and in the greater depth of its soil. These counties contain no towns of consequence, with the exception of Iowa city, the seat of government for the Territory, which is situated in Johnson county. This young city is situated on a very beautiful plateau on the left bank of Iowa River, about eighty miles from its mouth, by the windings of the stream, though not much more than half that distance in a direct line, and at the head of navigation on that river. Small steamboats go up to

* The writer considers the true name to be Kebe-saki, or Kebe-osaki, the last part of the word meaning island, and the same which is used to designate the tribe, commonly called Sac.

the city two or three times a year. There is here a fine capitol, erected at a cost of over \$100,000, and paid for by the sales of lots on the section given by Congress for that purpose.

In Jefferson county is the town of Fairfield, in which the Land Office for the Des Moines Land District is situated. In Henry county is Mount Pleasant, a handsome town upon the prairie. This county has also several villages, among which is Salem, a settlement of Quakers.

The other counties, formed out of the late Indian purchase, Davis, Appenoose, Wapello, Monroe, Keokuk, Mahaska, Poweshock, Tama, Marion, Lucas, Polk, Dallas, Jasper, Wayne, Clark, Story, are of a character similar to those of the older settlements. The soil throughout has but little variation; and with the exception of a few swamps, and a very small number of sand spots of little extent, the whole country is susceptible, by the mere upturning of the plough, with the most careless after-tillage, of being made one garden.

Wapello, Mahaska, Marion and Polk, are situated upon the Des Moines River, which is already described as containing some of the most fertile and beautiful land in Iowa.

Wisconsin is divided into twenty-four counties. Upon the lake are Racine, Milwaukie, Washington, Sheboygan, Manitowoc, and Brown. Grant, Crawford and St. Croix, are on the Mississippi. The other counties are Iowa, Green, Walworth, Rock, Jefferson, Dane, Dodge, Portage, Fond du Lac, Marquette, Calumet, Winnebago, Sauk, Richland and La Pointe.

Grant county is in the southwest corner of the Territory, situated in a bend of the Mississippi, which washes it west and south, and having the Wisconsin on the north, it is bounded by a water line throughout, except upon the eastern side. Lying within the mineral tract, it has a very valuable

deposit of lead ore. The soil is excellent; but by reason of the broken and uneven surface, some portions of it are not well adapted to the plough. It has a fair proportion of timber, and is a well-watered tract. Beside the two principal boundary rivers, it has the Grant, the Platte, consisting of two principal branches, one of which is called Little Platte, uniting about twenty-five miles from the mouth, and other smaller streams passing through it. Cassville is a small village on the Mississippi. It has the advantage of a handsome site, and will probably increase in importance as the country to the north and east shall become settled. Lead ore has been found in the vicinity, and the lands behind it present external indications of containing mineral.

Platteville is a more populous town, and there is a good business done at it. It has a pleasant interior situation near the Little Platte River, and is surrounded by a rich mineral and agricultural region. The Platte and Grant Rivers afford good water power, but are navigable for a short distance only. In mere business, Platteville has a rival in Potosi. In other particulars, especially in what is pleasing to the eye, Platteville has the advantage. Potosi has a larger population, is near the Mississippi, and the centre of very profitable "diggings." There is, in all the mining towns, a mixed population, the miners, as well as others who follow them for supplying their wants, and for making a subsistence from them in various ways, being from all parts of the world, and some of the last class especially, of rather a "miscellaneous character." Among the miners there is a good portion of shrewd men, true men and enterprising. Potosi is strongly marked with the characteristics of a mining town. Lancaster, a small interior village, on an elevated ridge, is the county seat. It has around it an inviting agricultural country.

The broken lands of Grant county are, for the most part,

on the borders of the Platte and Grant Rivers, and in the vicinity of the Mississippi. Almost every small stream also has its romantic bluffs and dales, but the county notwithstanding has advantages, as an agricultural and grazing country, in soil, timber and water, and in its salubrity and its river borders ; apart from its exhaustless stores of lead ore, which are from time to time laid bare by the enterprise and industry of the miners.

The country generally west of the Pectanon (so called by Long), or, as commonly called by the inhabitants, the Pekatonica, and south of the Wisconsin, is rather broken, but contains many spots highly suited to agriculture. The country, however, as a whole, as well as that west of the Mississippi, is admirably adapted to grazing. Grant county, just described, is included in this tract. A portion of Iowa county is also within it. This is an extensive county, bounded by the Illinois State line and by the Wisconsin River, for its south and north boundaries, and is one of great capabilities. It has an abundance of lead mineral, and copper ore also has been found and worked. The eastern part of the county is a fine agricultural tract ; and the whole country east of Pekatonica, to the lake, may be said to be a most delightful and fertile farming region. Mineral Point is the county seat of Iowa county. It has also the Land Office for the District, and is a point of much business, rendered so by the large number of miners engaged in the vicinity, by the smelting of the mineral, &c.

Iowa county contains a large proportion of prairie, extending, in its southern part, from Green county on the east, westwardly to Grant county, and in its northern part from Dane county on the east, along a beautiful dividing ridge, which extends westwardly into Grant. On this ridge runs the United States road leading from Fort Winnebago to

Prairie Du Chien. The timber in Iowa county is upon the borders of the Wisconsin and Pekatonica Rivers, and in beautiful groves scattered here and there upon the surface of the prairie. In all the prairie country it is expected that the growth of timber will be increased as settlement progresses, by the exclusion of fires, and the breaking up of the prairie sod. The lead ore region of this county extends from the Illinois line north to the Blue Mounds, 36 miles, underlying the whole county, longitudinally. But a small part of its mineral lands has yet been opened by the spade of the miner, and it will be a long time probably before the richest lodes will be reached. Most of the lead taken in this county is carried to Galena for shipment to market.

The lead region extends easterly to the waters of Sugar River, a branch of Pekatonica, about seventy-six miles, geometrically, east of the Mississippi at Cassville. With the change in the geological character of the country, there is also a modification of its topographical features and scenery. The surface becomes more even, and gradually assumes the appearance more decidedly of a plain country.

In the southeastern part of Wisconsin, the proportion of prairie country is increased, though about the upper banks of Rock River, Fox of Illinois, and Maple, all of which head within it, as well as upon the small streams, there is a sufficiency of good timber. Racine, the southeastern county, bounded by the Illinois State line and the lake, contains a large portion of beautiful and rich prairie with a gently undulating surface, which is now dotted with numerous thriving farms. It has two prosperous and growing villages, Racine and Southport, the former containing more than 2000 inhabitants, the latter nearly that number. The population is stated upon conjecture, without precise information, as the growth of these lake towns has been so rapid, that the

ascertained population of one year may be scarcely more than a moiety of the succeeding. They are the points of landing for the great mass of emigration by the northern route, and the quarters, consequently, of a temporary and fluctuating population, which drifts thence over the whole surface of the territory, and into Illinois and Iowa. The business of these towns depends upon the prosperity and increase of the agricultural population in the interior.

Milwaukie county is washed on its entire eastern boundary by Lake Michigan, on which, at the mouth of Milwaukie River, is situated the city of Milwaukie, which has become in about ten years from its foundation one of the first class of towns in the west. The population of the city exceeds 8000, or as some suppose, is not much less than 10,000. The growth and prosperity of the country may be inferred from the fact that in 1834 there were but two or three buildings on the tract which is now covered by the dwellings of its numerous residents. The country contains a wide tract of timber land, which lies immediately back of the city, and is now well peopled with hardy and industrious farmers from the northern States. The surface of the country is undulating and its soil very good. The eastern portion of this territory has a great advantage in its connection, by the Lakes, with the eastern markets, and being in all the essential attributes of soil, timber, and water, not inferior to the country west of the Mississippi, it is a most desirable country for emigrants.

Proceeding north to Green Bay, the country is more timbered, and undergoes a radical change of soil. In the neighborhood of the Bay the soil is sandy, and following the river to Fort Winnebago, at the Portage, the country is hilly and well timbered. Between Green Bay and the Lake is a northern vegetation of white pine, spruce, birch, &c. Near

Green Bay are large marshes of wild rice and cranberries, and near the Wisconsin River, in the western part of the Territory, are extensive swamps, having an abundant growth of the latter plant.

The town of Navarino is situated at the head of the Bay, and Green Bay is the name of a town on the lower shore near its mouth.

On the north bank of the Wisconsin River, from the Great Bend near the Fox portage, running westwardly nearly to the Kickapoo, is a range of high, abrupt, thickly-wooded mountains, a rare feature in the topography of this country.

The interior countries, south of the Fox and Wisconsin, cover a fine body of farming lands.

Rock county has a very advantageous situation on the upper waters of the Rock River, and has the requisites desired by the farmer of being well watered and timbered. Among the interesting and inviting features of the interior counties of Wisconsin are the small lakes found in Dane, Jefferson, Fond du Lac, and other counties. The shores of these beautiful reservoirs of limpid waters furnish many most delightful sites for farms. They are mostly found in the interior counties immediately south of the Wisconsin River and east of Sugar River, a branch of the Pekatonica. In all of them are found excellent fish, the pike of a large size, catfish, black bass, yellow perch, mullet, &c. A group of these lakes, four in number, stretch from northwest to southeast in Dane county, having an outlet in a branch of Rock River. This group is called The Four Lakes. Madison, the present capital of Wisconsin, and seat of justice of Dane county, is seated on a narrow isthmus, between the third and fourth lakes north. Proceeding northward from the southern tier of interior counties, the timber becomes more abundant.

The Blue Mounds, in the northeastern part of Iowa County, are remarkable elevations, the greatest height being 1,001 feet above the level of the Wisconsin at Arena, in the same longitude, as measured by Dr. Locke. They are about twelve miles from the river, south ; and thirty from Madison, nearly west.

St. Croix is a new county, west of Crawford, on the St. Croix and Mississippi Rivers. Though far to the north it is finely situated upon the Mississippi, and has very superior advantages for the lumber trade. It has great forest wealth, containing probably the best pine region in the United States next to the lumber tracts of Maine. With this valuable article of trade, and with very superior facilities for getting it to a most extensive and rapidly increasing market—there must of necessity be a very large business done in this direction. It is the opinion of the writer that this portion of the district also contains large deposits of copper ore. The eastern boundary of this county is the Chippeway River, and a line thence running northeasterly to the Michigan state line, and with that line to the Lake : its western is coterminous with the Territory ; its northern with the United States, extending from about $44\frac{1}{2}^{\circ}$ to 49° . Such was its boundary till 1845, when it was divided, and La Pointe, a new county, made in 1845, has been taken from that portion of St. Croix which was north of the mouth of Muddy River and Yellow Lake.

Crawford county is also of great extent ; including nearly the whole space northerly from the Wisconsin to the Michigan state line. This county has the Wisconsin on the south, the Mississippi southwest, the Chippeway on the west. It is watered also by the Bad Axe, Black River, Prairie La Crosse, and several other streams. Its breadth from east to west is by no means proportioned to its great north and south stretch.

It has a variety of soil and a diversified scenery. There is an extensive bottom between the two main rivers, on which is situated the old French town of Prairie Du Chien, three or four miles from the Wisconsin, a scattered settlement, rather than a town. It had been long occupied by the French, having been settled about the period of the revolution, and was a considerable trading post, and a rendezvous for the Indians and British. In 1814 the United States established a garrison there, and still maintain it. Within a year or two a deposit of copper ore has been found in this vicinity. On the Wisconsin is an abundance and variety of valuable timber, especially white pine. This is perhaps to be considered as the southern limit of the pine region, though scattered groves of it are found further south.

Since the purchase made of the Chippewas in 1842, of a tract of land which covered the northwestern peninsula of Michigan, six counties have been laid off therein, by that state. They are Michilimackinac, Schoolcraft, Chippeway, Marquette, Ontonagon, and Houghton. There are few settlers on the tract. The eastern point of the peninsula is a spot of peculiar beauty. Owing to its latitude, and to its vicinity to the lakes, the united influence of temperature and exposure to the winds, it is not to be desired for agriculture. A great portion of the tract is, no doubt, rich in copper ore, and other mineral wealth.

There are thirty-seven counties of Illinois wholly or partially within the district treated of in these notes. Joe Davies, Carroll, Whiteside, Rock Island, Henderson, Mercer, Hancock, Adams, Pike, Calhoun, are on the Mississippi River. The two last are on the Illinois also, being bounded by both rivers. Whiteside and Rock Island are on Rock River also, as well as on the Mississippi. Lake and Cook are on the Lake Michigan. Brown, Fulton, La Salle, Marshall, Peoria,

Putnam and Schuyler are also on the Illinois river beside Calhoun and Pike above-named; Rock Island, Whiteside, Ogle, and Winnebago, on Rock River.

Joe Davies is a mineral district. The lands about Galena, Fairplay, and Elizabeth, and in some other "diggings" in this county, are very rich in mineral. The county has a good soil, but is not of great value as an agricultural country, by reason of the broken nature of its surface. It is drained by Sinsinewa, Fever, Small Pox, and Apple Rivers. The country at the head of Apple River is a very beautiful and fertile district, and contains some handsome farms. The population of the county has greatly increased since the census of 1840. It was then 6,180. It now probably exceeds 10,000, of which nearly half is at Galena.

The first settlements were made in Galena, in 1828. This place is situated about three miles from the Mississippi, upon a little stream commonly called Fever River, or otherwise Bean River, being by the winding of the stream, six miles from its mouth. The river was first named by the French, and it is now disputed whether the appellation bestowed by them was *Fève*, or *Fièvre*. The circumstance that a small stream next below, and but a small distance from it, is called Small-Pox, and that the first place has had its share of the fevers of the country, may seem to favor the idea of the Fever. The pulse may be consulted to decide the important question.

By a law of Congress of February 5th, 1829, the Surveyor of the Public Lands was directed to lay out a town on Bean River, in Illinois, at and including Galena.

The town increased with a great rapidity. Miners pressed in from all quarters, and it became at once the metropolis of the lead diggings. Such it is, and will, no doubt, continue. It is most singularly situated, on the side of a steep bluff,

and consists of two narrow streets running parallel with the river; and, though they are placed as near as possible, the foundations of the houses upon the second are upon a level with the roofs of the first. Such is the business in this little nook, that the lower street always presents the appearance of a large and thronged city. Scarcely any street, in any city, has more of a crowd and bustle. Lately, some houses have been built on the opposite, or left, bank of the river, which is a better site than the original ground.

The lower part of Joe Davis, and the adjoining part of Carroll, is a very sterile tract, quite unusual in this country, except in a few points where the sand has been heaped up by the streams or the winds, or by the joint action of both. One of these causes, probably the river, was the agent in piling up sand here for several miles in extent, where, perhaps, there was formerly a deflexion of the river, or an expansion into a lake. Carroll county may not be ranked among the good agricultural counties, and is without minerals. Proceeding down the river, the land improves in quality. Whiteside has more good land. In this county Fulton has a good situation on the river, and a pleasant site. The exorbitant ferry charges have some influence in deciding against the prosperity of so small a village. Albany, also on the river, is a small village, with a site rather inferior to the former place.

Rock Island is at the mouth of Rock River, extending a long distance on the Mississippi, in a narrow strip, having the little villages of Cordova, Port Byron, Hampton and Moline, and the town of Rock Island on the river. The latter is a place of some business, has 1000 or 1,200 inhabitants, and occupies nearly the site of the old Sauk village, called Senisepo Kebesaukie, Rock River Peninsula. It is at the foot of the Upper, or Rock River, Rapids, opposite Davenport, known

to all who pass the river as the most attractive in natural scenery of any place within the usual route of the boats.

Mercer, Henderson, and Hancock, have some good land, but a large amount of waste upon the river, and an undue proportion of prairie. The towns of New Boston, Oquawka, Navoo (the city of the Mormons), and Warsaw, are upon the river in these counties, the two last in Hancock, as also Carthage, the county seat, back from the River. Hancock is a populous and important county. Warsaw, situated at the mouth of the Des Moines, has a commanding position. It is partly on the bluff and partly below. It will be the depôt for a considerable back country in Illinois, and for the products descending the Des Moines, which last will be of great amount when the State of Iowa shall become more populous, and the navigation of the river shall be improved. It is also the point where, in low water, the steamboats discharge their cargoes, which they are unable to transport over the rapids, the town being a short distance below. From here, the keel-boats, laden with goods, are towed up by a class of light draught steamers.

Adams, the next county on the river, is, in territory and population, one of the most important in the State. Quincy is the largest and best built town on the left bank of the river, between Alton and Galena, with the exception of the city of the "saints," so called as "lucus a non lucendo." Quincy is one hundred and fifty miles above St. Louis, and over one hundred and twenty above the mouth of the Illinois River. It is the depôt for the trade of a large country north of the river, and a populous, handsome, and flourishing town, with the Land Office for the district.

Below Adams, a large tract, extending from river to river, forty miles or more in average breadth, and from north to south about the same, is formed into the county of Pike. It

is the fourth county, in population, of Northern Illinois, or, rather, it is one of the four highest ; for, without a late census, the numbers are only matter of estimate, and there is not, probably, a great difference in amount between the four. Adams, Cook, and Fulton, may be supposed to contain from eighteen to twenty thousand each, and Pike sixteen or seventeen thousand.

Cook, Adams, Fulton, Pike and La Salle, are among the most populous and valuable counties in the State. Cook is on the lake. By the census of 1840, there were 10,201 inhabitants. Since that time, about 4000 have been added to the town of Chicago, and it is probable that the county now contains 18 or 20 thousand. Chicago has now about 10,000. It is the foremost town in the State in population and business. It is the principal port on the lake for northern Illinois and Iowa. Here great quantities of wheat and other produce are shipped, partly brought across the country from Iowa, for the New York market ; and most of the passengers by way of the lakes, are landed at this place and at Milwaukie. The Land Office for the District is here.

La Salle is an extensive county lying on both sides of the Illinois River. It is above the navigable waters of the river. The Illinois and Michigan canal passes through it, and it is thereby rendered accessible both from the lake and the Mississippi. It has probably exceeding 15,000 inhabitants.

Ottawa is the county seat, situated at the junction of Fox River, on both sides of the river, a few miles above the lower rapids.

Bureau, Kendall, and Peoria, follow, in descending the Illinois. Peoria is important for its population and extent ; its fertility, and resources, and business ; and in the beauty of its situation is not exceeded by any portion of

country on the banks of this river, which drew so much the admiration of travellers to the country in former times. The town of Peoria is situated on the river, at or near the site of old Fort Crevecœur, at the foot of the Lake Peoria, a little more than 200 miles from the mouth of the river. This fort was built by La Sale, as a point d'appui for prosecuting the discovery of the Mississippi. It is the county seat, and a place of much business.

Fulton, Schuyler, Brown and Pike, the last extending to the Mississippi, and already described, cover the most valuable, fertile, and beautiful tract, in the State, except some part of the land upon Rock River : in two important conditions having advantage over the last, being some two to three degrees farther south, which gives them a more propitious climate for agriculture, and a more genial ; and also having an open navigation generally through the year, while Rock River is locked up through the winter, and has but a difficult navigation at any time. Fulton is in the first class of counties for population. Spoon River waters this county, and enters the Illinois about forty miles below Peoria.

Schuyler is below Fulton : not varying much from it in soil, in which particular both are highly favored. Schuyler is less populous than Fulton. It has Crooked Creek passing nearly centrally through it. Rushville is the county seat, a place of some business. Brown county is less populous than Schuyler. The latter contains about 10,000 inhabitants; the other, two-thirds of that number.

For some miles above the point of junction, the two rivers approach very near together, and pursue an almost parallel course. The narrow peninsula is formed into the county of Calhoun.

Knox, Kane, Warren, are populous interior counties.

Knoxville, Monmouth, Macomb, and other villages, are upon this tract.

Illinois presents in general an agreeable and beautiful succession of grove and prairie, similar to the country west of the Mississippi, varying slightly in two particulars, rather to the disadvantage of the former ;—the proportion of timber is rather scanty in Illinois, and of consequence the prairies more extensive ;—and the soil is not of so great depth as on the west side of the river. The prairie on both sides, however, is extremely fertile, and very agreeable to the sight.

This region, or any portions of it, must be seen to be appreciated. Much better is a man's own eye to convey a faithful description to him, than the tongue of another. The quiet beauty of the prairies, the graceful outline of their surface, or the rich, mellow, genial, quality of their soil, is not understood without inspection ; nor does the mind of one only accustomed to the recesses of forest or mountain scenery, or to the still narrower barricades of vision formed by the high and compact lines of masonry in a city, take in the idea of a broad expanse of plain, stretching to the horizon on every side, without tree or shrub ; unfenced ; and still, after miles of travel, presenting a similar scene, limited only by a similar horizon ; adorned only with a variegated carpet of luxuriant flowers ; relieved only by the graceful undulations of its surface.

The country about Yellow Creek, a small tributary of Pectanon, presents a very beautiful specimen of prairie scenery. As you approach it from Galena, it rather suddenly appears to view in coming over a ridge, and the eye is astonished with the unexpected and agreeable presentation. Near the head of Little Rock River is another beautiful but different view. Yellow Creek is in the state of nature. Little Rock River is a handsome prairie covered with a

cluster of the neatest looking farms, with handsome fences and handsomer buildings, altogether presenting the most agreeable picture of agricultural life, ever seen by the writer. Such are some of the topographical characteristics of the branches of Rock River. This country has been highly commended, but the reality will not be found to be exaggerated by the description ;—the original cannot be heightened in the picture.

Ogle, Winnebago and Whiteside, and Rock Island, are counties upon Rock River. They contain some of the best specimens of western lands and western farms. Great quantities of wheat are raised here and in the whole Rock River country.

Northern Missouri has forty-three counties. In its other political organization it is similar to Iowa.

The counties are : St. Charles, Lincoln, Pike, Ralls, Marion, Lewis, and Clarke, on the Mississippi ; Warren, Montgomery, Calloway, Boone, Howard, Chariton, Carroll, Ray, Clay, Platte, Buchanan, Andrew, Holt, Allen, on the Missouri ; and Audrain, Caldwell, Davies, Clinton, Livingston, Macon, Randolph, Monroe, Shelby, Knox, Scotland, Schuyler, Adair, Linn, Highland, Putnam, Mercer, Grundy, Harrison, Gentry, De Kalb, Nodoway, between the rivers and the north line of the state.

Northern Missouri presents no very striking change in its geology or in the essential features of its physical geography from the characteristic formation and internal structure, or from the superficial aspect, of the country, that has been described. It is a limestone country, and a plain. The principal points of difference are that in the eastern portion the proportion of prairie is rather less, and the soil much thinner. The subsoil is similar. Springs are not so abundant. The larger proportion of timber is an improvement in point of scenery. Proceeding west and

south these differences diminish ; and on following the Missouri the land is perhaps equal to the best on the Mississippi. The land first described is that portion east of the ridge which divides the waters of the Mississippi from the tributaries of the Missouri. It is about one degree in width between the ridge and the Mississippi, and extending from the Missouri River to the north line of the state, a little less than two degrees. The four main branches of the Chariton, and the eight or ten of the Grand River, pouring down their streams in nearly parallel courses, from north to south, and in very close contiguity, the whole dozen or fourteen streams being within the range of a degree and a half, or about a hundred miles, forms a peculiar feature in the topography no less than in the hydrographic character and agricultural capacities of this region. It is needless to say that such a country possesses fine farming lands : and beyond the Grand River westerly to the Missouri, particularly the Platte valley, is equal to any other, and presents strong allurements to emigrants.

A great difference in the social condition of this portion of the tract exists, in the institution of slavery : and a consequent difference is produced in the industrial pursuits, which everywhere distinguishes free from slave labor. This is the only portion touched by our notes where slavery is allowed.

St. Charles' county lies between the Mississippi and the Missouri, extending back fifty miles, and being, in greatest breadth, about twenty. At the point of confluence of the two rivers, is a large tract of low bottom land, extremely fertile, but subject to overflow at the occasional high waters of the river. The upland above is rolling, being in nearly equal parts prairie and timber, watered by Cuivre, Big Creek, McKoy's, Femme Osage, and Dardenne : the land pretty

good, for this portion of the country. The county contains iron, coal, and it was formerly supposed that there was copper on the creek, which the French, from that belief, named Cuivre. Some marble also exists, and potter's clay and Spanish brown, of good quality. The county is divided, politically, into five townships, and has several towns laid out, the principal of which is St. Charles, a very pretty town on the left bank of the Missouri. The settlement of St. Charles was commenced in 1780, while that country belonged to Spain:—and soon after emigrants began to go there from the United States. Emigration was encouraged by the Spanish policy of granting lands to settlers. It is about twenty miles from St. Louis, has increased very greatly in twelve or fifteen years past, and now contains probably about 7,000 inhabitants. Portage des Sioux, an old French village on the Mississippi, contains about 400 inhabitants.

Lincoln county is on the Mississippi, next to St. Charles on the north. A considerable portion of the lands of this county are covered with old Spanish grants. The quality of the land generally is not good, along the river counties from the Missouri to the north line of the state. There is a wide strip of bottom land, part of which is low and subject to overflow. Along the travelled road through this county, and for some distance north of it, water is very scarce. Troy is the county seat, and a well-built town, twelve miles from the Mississippi.

Pike county, the next on the north, was originally mostly a timbered tract of land, and has many streams passing through it. The largest of these is Salt River, which runs through the northern part of the county. It is said to be of good soil, compared to some of the neighboring country. There are several mills in the county. Bowling Green is

the capital town. Elk Lick is medicinal. Clarksville and Louisiana are villages on the Mississippi within this county.

Ralls county, on the river, next north of Pike, has some branches of Salt River passing through it, and Spencer's Creek. It is said also to have good springs. Iron, sulphur, and coal are found within it. New London is the county seat.

Marion county has a portion of its lands drained by Salt River, North and South Creeks, and North and South Fabius. It has coal of a good quality, and it is said to possess nitre in great abundance. There are several salt springs. As nitre is an element of fertility, the county should be productive, and it is considered to be so. There are many mills on the streams within the county. Palmyra is the capital, a very handsome flourishing town. Here is the land office for the northern district of this state. A town is laid out on the river, called Marion City. Hannibal, also on the river, is a flourishing town, and a place of some trade. Salt River, which has been mentioned as passing through portions of this county and Pike, is the largest stream between the Missouri and Des Moines, flowing into the Mississippi.

Lewis county is north of Marion. It is advantageously situated on the Mississippi, being favored with two or more good landings. The site of La Grange is high and dry. The county is watered by Wyaconda, North, and South Fabius, and Fox creeks. Monticello, in the centre, is the county seat.

North of Lewis, and the most northerly river county in the State, is Clarke. The land of this, as of the last county, is good, the soil becoming better toward the northern part of the State, than in the counties lower down, near the

Missouri. St. Francisville is the principal town, situated on the Des Moines River.

Warren, Montgomery, Callaway, Boone, Howard, Chariton, Carroll, Ray, ——— Clay, Platte, Buchanan, Andrew, Holt, Allen.

This range of counties on the Missouri contain generally a richer soil than those on the Mississippi. Howard county is populous, well timbered, abounding in coal, not of the best quality so far as worked, and watered by several small creeks. The large streams called Chariton and Grand River flow into the Missouri in Chariton and Carroll counties. Boone is the second county in the State in population, next to St. Louis ; Howard is the third. Boone contains about, or exceeding, 25,000. Howard over 20,000, estimating from former rate of increase. Accurate information on this point, at this time, however, is wanting. Callaway, Clay and Ray are also populous counties. The tract comprising Howard, Boone and Callaway must be considered the best in the State, as it is the most populous. It is inhabited by farmers, whose industrious and skilful cultivation of the excellent land upon which they have settled, has made them easy in circumstances, and developed the resources of a rich country. Columbia is the county seat of Boone, centrally located. Fayette is the capital of Howard. Glasgow, on the river, in the same county, is a flourishing town. The southern portion of the country, which is the subject of these notes, is passed with less observation than that comprised within the territories, as being both better known, and also the less interesting to many, because more populated, and therefore offering less inducements to settlers. The soil also below the Des Moines is inferior to that north of that river, and the country by no means so inviting. Portland, Frank-

lin, Chariton on the river, and Carrol and Huntsville back from it, are towns of some importance.

It has already been said, in treating of the physical geography of this country, that it was remarkable for the great number of lakes.

The lake region extends from 49° to 43° , or over six degrees of latitude, and lies chiefly to the east of the Tchan-sansan (or James), in 98° of long. From the head waters of the Des Moines to the country about the heads of the Mississippi, they are so numerous on the western part of the valley, that a small addition to the water surface would make it doubtful whether it should be called land and lake, or sea and island. South of 43° the remaining four degrees of lat. to 39° , is traversed by a vast number of running streams; and these two portions may be very properly distinguished, with reference to these grand characteristics, as the river country and the lake country.

It will be at once perceived, on stating this difference in the hydrographical features of the country, that there is a corresponding difference in the topography; that the inclined plane of the southern portion, reaching its summit, is changed for the more level plane; and that the northern part is less cut and scooped by the numberless deep ravines that mark the lower country, serving it as channels for draining it into the principal streams.

The upper country is described by Nicollet as very beautiful, and affording many fine farm sites.

PART IV.



SOCIETY.—LAWS.—PURSUITS.—LIFE.—HABITS.—HEALTH.
—PUBLIC LANDS.

THE population of the Upper Mississippi is of various origin and mixed character. The germ is French. Colonies from France, and from the French stock in Canada, were first established at several points in this valley ; and, from time to time, the voyageurs, or French boatmen, and the coureurs des bois, or traders, have visited nearly every part of this extensive region, some of whom fixed a temporary residence, and others a permanent dwelling, among the native tribes, with whom they became mingled, and frequently connected by marriage. The descendants of these French, both of the unmixed and the mixed blood, are numerous in the country, and to them many accessions from the same race have been made in modern time by emigration from Canada. A great part of this population is illiterate : though among them are many persons of good education, fine intellect, and a refinement, peculiar to their nation, beyond that of the best of the other population. Such may be found in the humble and laborious occupation of digging in the mines. I lodged in the house of a farmer, one of these people, on the banks of the Missouri, opposite to St. Charles, having the refinement of the French gentleman, and a mind capable of discharging

the functions of the highest offices in the nation. He had been acquainted with the country twenty-five or thirty years, and had been to the mountains, as many of these men do. It is not uncommon for young men of wealthy families in St. Louis to leave the refinements and luxuries of the city for a trading trip to the mountains, or to Santa Fé. To this initial population have been added, Germans, English, Scotch, Irish, and a mixture from each of the States. They are, of course, of every shade of character; and the traveller from the denser and older portions of the world would frequently have his astonishment excited, on entering a very rough log-cabin, consisting of one room, with a puncheon floor and mud chimney, to find a farmer of a cultivated mind and manners,* or a lady who has graced the gay and fashionable parties of the city, or, frequently, her superior, whom education has endowed with the solid and shining accomplishments of woman, and fitted for the highest spheres of life. Among these may be found, in most free intercourse and fellowship, the differing and various shades of character: the rough in extreme, but honest and worthy; the vulgar and clown of all shapes and dimensions, whether rich or poor, laboring or professional; the counterfeiter and horse-thief, sitting side by side with the judge and senator. There is a general and equal association of all persons, without regard to character, condition, or circumstances, making society one smooth and perfect level. This is not a very agreeable con-

* The remarks of Mr. Birkbeck, an intelligent and observing Englishman, who came to Illinois about the period when it became a state, made in relation to the western people generally of that time, will, I think, well apply to the population now inhabiting this portion of it:—"Refinement," he says, "is unquestionably far more rare than in our mature and highly-cultivated state of society; but so is extreme vulgarity. In every department of common life, we here see employed persons superior in habits and education to the same class in England."

dition ; but it is the result of circumstances in a new country, where all are poor, where all are incommoded, all seeking the one thing needful (worldly speaking), and seeking it in the same way, and surrounded by nearly similar accidents. The ladies in the towns are not very easy under it, and try to remedy it; but they go again to the other extreme, and the result of the separation and selection which is adopted in the little towns is infinitely amusing, and a sufficient burlesque upon the more pretending, but generally equally oddly-assorted, select circles of the rich and vulgar in the larger cities. This condition of things is rather unfriendly to the courtesies and premeditated civilities of social intercourse, which are still more hindered by that want of acquaintance which is a necessary incident to the sudden filling up of a new country with people from all parts of the world. There is a general prejudice against the New Englander throughout the south and west, which, among the ignorant here, amounts to detestation ; but, with this exception, the population agree very well.

The condition of the territories in regard to schools is not good, and the standard of education is low in the whole country, including that portion within the States. The standards of the bar, the pulpit, and in medical science, are all at a low point. A young man who has had a schooling of one year, and the same amount of reading in law, frequently without instruction or direction, sometimes by an apprenticeship, is made a lawyer ; such, at least, he is designated by legislative enactment, and the license of the court, but he is often, in a double sense, an infant in law. I believe a less qualification suffices for the pulpit, or the practice of medicine. There are also instances of a similar want of preparation in other pursuits. Persons are found engaged in trade, and employed in some of the mechanic

arts, without having passed the usual apprenticeship. This condition of things pervades the whole fabric of society. Judges have been appointed here of less than twenty-five years of age, and of only two or three years' practice at the bar ; and a judge of that green age sits *alone* on a trial involving life or death ! In this way, the laws are administered, under the sanction of Congress and the government of the United States !

There has been a singular and radical change of the system of law by which this country is governed. The whole of this territory was first discovered and settled by Frenchmen, and charters and ordinances for its government were granted and established by the king of France. By this means, the civil law was extended over the country, and became the birthright of its inhabitants, in the same way and by the same means that the common law became the birthright of the original thirteen States. The country west of the Mississippi was afterwards possessed and governed by Spain, which, as well as France, has the civil law for its code. Thus, in the portion of country west of the Mississippi, the civil law prevailed by a double title ;—both by birth and baptism it became the law of the land. It has never been formally abrogated, yet it is utterly extinct. By the ordinance of 1787, for the government of the Northwestern Territory, the common law was extended over that country ; and, by subsequent enactments, it has been established west of the river. Perhaps it was supposed that the system of the common law was so entirely repugnant to that of the civil, as to operate a repeal of the latter. It is, however, more probable that the lawyers and judges, who had been practitioners of the common law, did not inquire if that might be engrafted on the civil, but wholly overlooked the fact that the latter had ever had force there. However that may be, whether by

some real or supposed efficacy of the ordinance, or by some other means, the principles of the forum have been supplanted by those of Westminster;—and the common law, with some statute modifications, is the only law.

The character of the legislation is not so good as it might be. The members of the legislature are mostly very young, and uninstructed in the principles of legislation or the operation of law. The enactments are of course neither conceived in wisdom nor drawn up with skill. In this particular, however, some of the old states are not at all in advance. The most objectionable enactments of the territories will stand comparison with the laws of Maryland.

Society here is yet in that stage when a man's only thought is to gain a subsistence; and he cannot give attention to the improvement or refinement of his own mind, or of the public mind or morals.

By the constitution of Iowa, however, a most extensive and solid foundation for a system of Public Schools in that State has been laid, by the following provisions :

“2. The General Assembly shall encourage, by all suitable means, the promotion of intellectual, scientific, moral and agricultural improvement. The proceeds of all lands that have been or hereafter may be granted by the United States to this State for the support of schools, which shall hereafter be sold or disposed of, and the five hundred thousand acres of land granted to the new states under an act of Congress distributing the proceeds of the public lands among the several states of the Union, approved A.D. 1841, and all estates of deceased persons, who may have died without leaving a will or heir; and also such per cent. as may be granted by Congress on the sale of lands in this State, shall be and remain a perpetual fund, the interest of which, together with all the rents of the unsold lands, and such other means

as the General Assembly may provide, shall be inviolably appropriated to the support of common schools throughout the State.

"3. The General Assembly shall provide for a system of common schools, by which a school shall be kept up and supported in each school district at least three months in every year; and any school district neglecting to keep up and support such a school, may be deprived of its proportion of the interest of the public fund during such neglect.

"4. The money which shall be paid by persons as an equivalent for exemption from military duty, and the clear proceeds of all fines collected in the several counties for any breach of the penal laws, shall be exclusively applied in the several counties in which such money is paid or fine collected, among the several school districts of said counties, in the proportion of the number of inhabitants in such districts, to the support of common schools, or the establishment of libraries, as the General Assembly may from time to time provide by law."

The principal employments here must always be those connected with agriculture. The soil, greatly superior as it is to all other within the United States, cannot fail to invite a crowd of laborers to the harvest. But it is better even for grazing than for tillage. The grasses, in several varieties, grow with astonishing luxuriance. Some of the bottoms bear a grass from eight to nine feet high.

The prairies have been mentioned and partially described already. The geological structure of these lands was exhibited, and the general appearance of their surface indicated in speaking of the physical geography of the Upper Mississippi. The prairie lands are similar on both sides of the Mississippi. Conjecture is at fault in endeavors to account for their origin. Two circumstances unite to retain them in

their condition, and prevent the growth of grove and forest over the spaces covered only with the long grass and flowers. The roots of the grass are exceeding tough, and form a sward which keeps down the slower vegetation of the embryo forest, which is here, as elsewhere, conceived within the mould of the teeming earth. This sward is so compact and strong, that five or six yoke of oxen are necessary for a breaking team, with a very large plough running on wheels, called a prairie plough. The other circumstance adverse to forest growth, beside the sward, is the annual burning of the prairies by the Indians and hunters, which has been practised since the country was first visited by the French in the seventeenth century, and is said, by the discoverer of the Mississippi, to be an old custom of the natives. The bodies of timber are almost exclusively on the streams, and the spaces between are prairie ; presenting, at their junction, the similitude of shore and sea ; which likeness, no doubt, induced an old sailor (whom I know) to fix his residence and build his house on one of these *points*, as the projections of the groves into the prairie are called, where, in prospect lay before him a wide expanse of prairie

“ Stretching
In graceful undulations, far away
As if the ocean in his gentlest swell
Stood still, with all his rounded billows fixed
And motionless—”

The prairie has, for the most part, this undulating surface. Some of it is broken by ridges and deep ravines, some only slightly undulating, sufficient to shed the waters, some a dead level as true as could be drawn with a line. Of course some of these tracts of prairie are wet, others dry. On these prairies, so long as the country is only partially settled,

and the lands unappropriated and unfenced, the cattle of the neighboring settler make their summer range, finding the most abundant and the sweetest pastures. At the end of their summer feeding these cattle are all good beef without any stall feeding ; and the butter is the most delicious in the world. During a residence of six years in Iowa, the writer scarcely ever ate butter that was not superior to the *choicest* butter to be purchased in any of the eastern cities. The prairie grass is also cut by the farmer for his winter feeding, and supplies a coarse but sweet and excellent hay. In most places in the new settlements it is the only hay used. In a few years' mowing, however, the weeds succeed to the grass, and it becomes necessary to go further for the hay, or to introduce the English hay upon the farmer's own grounds.

The cost of breaking the prairie is from \$1,50 to \$2 per acre, at this time, in the older parts of Iowa, and other places where settlements have been made ten or fifteen years. In the newer settlements, it is always higher ; and all expenses of living, and the price of labor, are greater. In the first settlement of Iowa, as high as \$5 an acre was paid for breaking. The wages of a farming hand was then from \$25 to \$30 a month ; now, it is about \$8 to \$10. Provisions then bore about the same proportion to the present prices.

The cost of making a prairie farm at this time in the river counties, or in the parts of Iowa known as Scott's purchase, comprising all the country to which the Indian title was extinguished prior to the treaty of 1842, is subjoined :

Price of a quarter section, 160 acres, at \$1,25 per	
acre - - - - -	\$200
Breaking forty acres, at \$2 - - - - -	80
Fencing with post and rails, 5 rails high, 40 acres, or	
5280 feet, 6 rails for every ten feet, including 1 to	
each pannel for post, will take 3168 rails, at about \$1	
per hundred, say \$32 - - - - -	32
Cost of setting uncertain.	
	<hr/>
	\$312

The price paid for getting out rails is usually 62½ cents a hundred. If brought from a distance, the transportation will of course increase the price. They are brought down the Mississippi, and sold at the landing at the foot of the Upper Rapids, at \$2 a hundred.

The cost of a cabin may be set down at \$50 to \$150; and with stable and sheds, may make the whole amount to \$500.

Eighty acres of land is quite sufficient,—will yield as much as 200 acres in the east, and, especially while the pasture and hay may be taken from the public lands, should be the limit of a farmer's purchase. This would reduce the cost \$100, or save him that sum to add to the improvements.

The product of an acre ranges from 50 to 80 bushels of Indian corn, from 30 to 40 bushels of wheat, from 70 to 80 of oats. All the roots grow with great luxuriance, onions attaining to five or six inches in diameter; radishes, and the long roots, to double the common size in the east. Potatoes, and other garden vegetables, are of superior quality and abundant yield.

The farmers of this country are generally men of good habits, and of good information and sense. They are also hospitable and kind. With the small expense which I have

set down, and with the addition of a little farm stock,* a farmer makes himself comfortable, nay, independent, for life. He has, it is true, a rough dwelling, but warm, and his table is abundantly supplied with all that is produced on the soil, and generally with the necessaries from the stores. He can have his bread, and potatoes, and beef, and pork, almost without a thought. He knows nothing of the toil, cost and skill requisite to manage a farm east of the mountains. His cattle range the richest pasture in the world, and his hogs find their food in the abundant mast of the groves. His plough merely turns the sod, and no artificial garden mould can be made to rival the fertility and easy tillage of his fields. The only thing that can be suggested unfavorable to the soil of this country is, that its very great productiveness may not be propitious to habits of industry in the cultivator.

Standing upon the bluff of the great river, and casting around the eyes of the mind over the transvisual and into the future, I behold, at no distant point of time, but in clear and close prospect, a vast plain, and beautiful more than vast, surpassing in fertility and easy culture the most favored regions of the earth, stretching westward from the Mississippi to the Upper Missouri, and eastward to Michigan; and from the mouths of Illinois and Missouri northward to 45°, to St. Peter's, and the Coteau des Prairies, covered with a hardy and industrious population,—one great magnificent garden—clothed in green and gold; smiling with a harvest, the bountiful supply to the inhabitants of the whole world. This tract covers six degrees of latitude, comprising about 150,000 square miles, or 100,000,000 acres. So very trifling is the unproductive land, that, with a reservation of the necessary wood-land and the portion devoted to the support of the

* Horses are worth from \$40 to \$60, cows \$10 to \$12. These are the best prices *when they are put in market.*

farm animals, one half of this amount may be put under plough if necessary ; and yielding thirty bushels to an acre, which, saving casualties, is below the average of the wheat crop ; its product would be 1,500,000,000 bushels for a year, or of Indian corn, double that quantity :—and this without the use of foreign fertilizers, almost without toil. The chemistry of nature can do no more to make the earth yield her increase, than has been done here. God has never offered a richer vineyard to the hand of man to dress and to keep than this which is now spread out in prospect fair and wide, and offered to the multitudes harassed and anxiously striving for subsistence against the excessive competition of the thronged avenues of life and living east of the mountains, and to the famishing millions of the superannuated hemisphere beyond the sea.

The Upper Mississippi, surpassing all other districts in agricultural capabilities, is even more superior as a grazing country. I think it not too much to say that a given number of acres here, in the best parts of the tract, would support more than double the number of cattle which the same quantity of land will feed east of the mountains. Very superior beef is made upon the summer range, not surpassed by the best stalled meat. It makes butter not equalled by any other feeding. And it is said that sheep increase their size and their fleece upon the prairies. The advantages over other countries for wool growing may be perceived at once by a short statement. The sheep have the summer range upon the prairie without cost, and the expense of their winter feeding is trifling. The prairie hay is put up by the farmers at a cost of \$1.50 to \$2 per ton. Suppose a thousand sheep will be wintered on one hundred tons of hay, which is near enough to the truth, beside their other food. The cost of one hundred tons of hay will be from \$150 to \$200. In

most parts of the country hay is worth at the lowest \$10 per ton, and the expense of their feeding would be \$1000. Here is a difference, at the least, of \$800. Their other feeding would farther diminish the sum total of the expense. In this business of wool growing a farmer may make himself independent for life with \$1000 or \$2000. The cost of getting it to market at Boston or New York does not exceed one cent per pound, a mere trifle on the value.

The exports of wheat, hides, wool, beef, and pork from this region may be made to supply the world. There is even now a large excess over the consumption of the country. Great quantities of wheat are converted into flour by the mills of the country, which make the best quality of superfine flour. The advantages for milling are not surpassed, and the making of flour will, in a very short time, become one of the great branches of industry of the country. Butter and lead will also be heavy items of export.

Mining is one of the principal pursuits of the inhabitants of this region. There are probably from three to four thousand, or more, persons digging for lead in the mineral district. This tract, as has been already stated, extends over a portion of Iowa, Wisconsin, and Illinois. There are about fifty furnaces employed in smelting the mineral.

The veins vary from one inch to one foot in thickness; and also differ greatly in the depth, or descending extent. A vein of half an inch thick will usually give a profit for working it, in rock digging, where blasting is necessary. The crevices which contain the veins of ore, usually run from east to west, nearly, with a small variation. This direction is very uniform; though some have been found quartering, and a few, chiefly from Mineral Point to Wisconsin River, having a north and south direction. Those which

have been found running to this point on the west of the river, are very small veins.

There are two modes of digging for the mineral ; by sinking a shaft or vertical aperture, which is the more usual ; or by opening a drift, which is the name given to a horizontal cavity. In many cases, in working a shaft in the rock diggings, on the west side of the river, the digger goes down more than a hundred feet before finding a crevice.

The horizontal angle of the crevices varies from zero to a right angle, the same crevice taking alternately all directions.

Some skill is necessary in selecting the spot for operations. The proper ground is known to the experienced miner, by several indications. The form of the surface is one of the signs. The ground has usually a depression transverse to the general slope. There is sometimes a change in the vegetation. A rank growth, in a direct line, of the long-rooted plants, is one of the indications. Pieces of crystallized lime are found on the surface, which are familiarly called the lead blossom, and, on digging, detached fragments of rock containing some mineral are usually taken out very near the surface, and sometimes found without digging, called gravel mineral. Black flowers imprinted on the rock, as if by the action of gunpowder, resembling ferns, are also indications of ore. When these signs are sufficient, the miner commences "prospecting," as he calls it.

The ore, or "mineral," as it is always called by the miners, is found in crystalline form, from the smallest size visible, to masses of half a ton in weight. It is usually found in black or ferruginous clay. It sometimes fills the whole crevice, and is then called "sheet mineral;" sometimes in detached pieces, and is called "chunk ore." In the rock diggings there is usually a thick stratum of limestone overlying the rock which contains the mineral, which

superior stratum is called the "cap rock." The fissures containing the ore frequently expand into large caverns. They are generally, in this case, found studded with stalactites of calcareous spar on the roof.

In the clay diggings the ore occurs in detached fragments, and is called "float mineral."

The surface of the ground, in certain parts of the mining district, is completely honeycombed with the shafts of the diggers, to the danger of cattle and travellers. The workmen descend into the shafts, and raise their mineral by means of large tubs fixed to a rope and windlass. The mineral is very pure, generally yielding about 80 per cent. of lead. An analysis of two average specimens of galena is given in Mr. Owen's report as follows :—

	1st spec.	2d spec.
Sulphur - - - - -	16.00	14.63
Lead - - - - -	84.00	85.37
	<hr/>	<hr/>
	100.00	100.00

Mr. Owen, in his report to the government, gives the following statement of the process of mining :—

"When a miner sets out in search of lead ore, he usually begins by what is called 'prospecting;' that is, on those spots where surface or other indications lead him to expect a discovery of ore, he commences digging holes or sinking shafts, usually on the summit or the declivity of a hill. Should he fail in the first attempt to reach gravel mineral, or to come upon any signs of neighborhood to a fissure, he soon abandons the spot, and begins to dig elsewhere. The ground in many portions of the lead districts is found riddled with such pits, called, in the language of the Wisconsin miner, 'prospect holes.' Should he reach encouraging symptoms,

or actually strike upon a vein, or upon detached pieces of ore ranging downwards, he continues his labor, often with very great profit.

“ When, after preliminary examinations, he decides to sink a shaft, with the view of striking a crevice, he is compelled, until he reaches the rock, to wall up the shaft with logs.

“ These shafts, of irregular form, usually approaching a cylinder, are generally from four to five feet across. Sometimes the rock is soft enough to be quarried with hammer, gad, and pickaxe ; at others, it is found necessary to blast it with gunpowder.

“ The mode of descending is by means of a rope of raw hide, and a common windlass worked by one or two men. By the same simple contrivance, the ore is raised to the surface. Sometimes, but rarely, ladders are used to ascend and descend.

“ When a miner is fortunate enough to discover a productive vein accessible from a hill-side, he forms a drift, and very conveniently conveys the ore out in wheelbarrows—of course, at a very trifling expense.

“ The shafts are sunk in this lead region to the depth of fifty, one hundred, or one hundred and fifty feet. They are usually abandoned as soon as the mine is inundated with water, unless the miner, by drifting (that is, working horizontally) until the external surface of the hill is reached, can readily drain the mine. There is but a single instance in the district where a mine has been prosecuted after being flooded with water, which could not thus be got rid of—namely, at Hamilton’s diggings, near the Peccatonna, where the mine is readily drained by a small steam-engine. The water in this mine was struck at the depth of thirty feet, and the mine has been worked with profit thirty-five feet below that point.

“ In the deeper diggings, the *damp* (carbonic acid gas)

sometimes accumulates in such quantities towards the bottom as to render it dangerous to work. This happens chiefly in the hot months of summer ; and at such seasons the miners are frequently compelled to discontinue their labors.

“ The means of ventilation yet employed are very simple. A cloth funnel, its upper portion so placed as to receive the breeze and to deflect it into the shaft, is the only contrivance.

“ The lead ore, which, with a few local exceptions, is alone found or worked in this district, is the *galena*, or sulphuret of lead ; the same species of ore from which nearly all the lead of commerce is derived.

“ One of these local exceptions, however, is to be found at Mr. Brigham’s mines, near the Blue Mounds, where carbonate of lead is raised in considerable quantities along with the galena. This carbonate is also found in other portions of the district. It is very easily reduced—more so than the sulphuret, inasmuch as the carbonic acid is more readily expelled than the sulphur.”

The value of the lead sent down the Mississippi annually for several years has been something over one million dollars. A considerable quantity also goes by the lakes to New York : and probably, taking into the computation what goes out in both directions, and what is used in the country, the whole produce of the mines is one and a half million dollars.

It is evident, upon an examination of this statement, that the business of mining is not a very profitable one to those engaged. Taking the whole value to be one and a half million dollars, of which one-third goes to the smelter, we have one million dollars to be divided among, say 3,000 laborers, or three hundred and thirty-three dollars to each, as the result of the year’s labor. But this is very unequally

distributed ; and perhaps ninety in each hundred actually realize much less than this, while a few make fortunes.

In the northeastern part of this district, on lands south of Lake Superior, lately purchased from the Chippewas, is a body of copper ore, supposed to be the richest in the world. It is almost pure in some specimens : so that, as taken from the earth, it was wrought into church vessels by some of the French who first visited the place ; and a portion of the large rock deposited in the ground of the War Department at Washington has been polished so as to present the appearance of sheet copper. Many companies and individuals have taken leases of the government, and commenced operations there. Some of them have had good success, and have found silver as well as copper. This will no doubt soon be an important business, and give regular employment to many persons. The iron and coal will also at no distant time be worked ; and in Clinton and Jackson counties, in Iowa, in the great coal district in Illinois, and perhaps on the Des Moines, in Iowa, will be a great number of laborers engaged in quarrying coal, and in digging and working iron.

In the territories of Iowa and Wisconsin, which comprise the principal part of the district subject to these notes, the channels of industry are not yet shaped by the small and irregular streams that have only partially occupied them. The business of the country has hardly yet taken a direction ; and all the secondary pursuits, trade, the mechanic arts, the professions, have not acquired the consistency or development of matured form. The professions are doubly stocked ; the other pursuits are many of them not sufficiently filled ; there is that languor in industry and enterprise, necessarily consequent upon a rapid growth. The circulation is sluggish—the arteries are not well filled with a healthy fluid. Money is wanting, wealth, means, men, enterprise, are needed, to

bring up the business of the country to a parallel with its population. The first has moved on with a slow and laggard step, while the last has pressed on with a series of continued strides outstripping the imagination. Men and capital, men *with* capital, and men skilled in the arts, and enterprising, are they who are wanting there. Mill-wrights, and millers, tanners, and leather-dressers, saddlers, shoe-makers, wool-carders, brick-makers, brick-layers, stone-masons, and carriage-makers—traders with capital, knowledge, and liberal views of trade, will all find a broad field and a fair chance.

The emigrant comes to this country frequently in his large, covered freight wagon, drawn by four horses, containing his household utensils, called, in the language of the country, plunder: his wife, and girls, and small children, put in to make stowage, and himself, and one or two of the bigger boys on foot, driving the cows and hogs. In this way he travels day after day, and week after week, sometimes month after month, stopping by the side of a brook at night, cooking his food with the wood lying near, making his supper with spice superior to that of the Indies—a good appetite—and sleeping at night on the bank of the stream, where he had before spread his table: his board and couch supplied by nature. If the weather is inclement, all bundle into the wagon or on the ground, beneath its cover, and slumber there. When he finds a place that suits him for settlement, if it is unoccupied, he is of course at no loss for accommodation. He has the same lodging that he had upon his journey, and, being his own entertainer, any defects in the entertainment will not make a difference between such good friends. He lodges in the wagon or by its side, cooking his repast from the faggots lying in the grove, till he has laid up a log cabin for his residence. This is generally constructed of logs as taken from the grove, unshaped, and with the bark on: with a puncheon

floor, as he calls it, that is, made of split logs not sawed or dressed, with a chimney of sticks and mud, and with one door and one half-window. The chinks of the cabin are stopped with chunks of wood and filled in with mud. In this residence, consisting of one apartment, with a furniture corresponding with the style of the architecture, his family of half a dozen find accommodation, and travellers are lodged when they ask it.

Here he lives in content ; breaks up forty acres of prairie and fences it, drops his seed, and, without the expense or labor of spreading foreign fertilizers over his field, has an abundant crop. His bread and potatoes come almost at his bidding. He lives an easy and a happy life, certainly. He treads upon flowers. His path is literally strewn with them. The prairie around his cabin is a flower-garden. The dew, which is only poetry to the man of imagination, and sparkling romance to the novel-reading miss of the city, is to him an every-day reality, bathing his feet when the lark sings to his going out in the morning ; spreading his fields with a silvery mantle, and filling his stacks with a golden harvest.

But life in a new country has its privations and hardships. Notwithstanding the ease with which he gets bread, there are many of the comforts of living that he cannot obtain. To the man who has been used to them, their loss is severely felt ; but to the roving emigrant, to the real pioneer, they are unknown. He has always hung on to the skirts of civilisation, but without knowing its advantages or comforts ; and, whenever a new purchase has been made, his wagon-wheel has pointed the way to the settlers coming after him. Thus he passes his life : sojourning in the purchase a few years till another is made, and then hastening away to a new abode to occupy that in turn till a settler upon a neighboring town-

ship, or a new acquisition from the Indian, furnishes an incentive to move again further west.

This first class of moving emigrants, or pioneers, commonly select for their residence a position in a grove, or dense body of timber, where, by the exclusion of sunbeams, and almost of the atmosphere, a perpetual dampness reigns. This is frequently upon a low bottom, or on the banks of a stream. Though he has no intention of passing his life there, yet the fancied wealth of the timber region, its superior value, as he thinks, over the prairie, decides his choice in favor of that position ; and, neglecting the high, open, healthy prairie, that spreads before him, a sea in extent, a virgin soil unequalled and inexhaustible, where, in two years, he might be the possessor of a rich farm, he seeks the immersion of a dense and damp forest, where, with his poor cabin and his habits of life, his exposure and hardship, combined with the atmosphere and the decaying vegetation, the fever and ague is soon added to the list of his comforts, and sets its mark of pallid emaciation on the countenances of the family. This injudicious selection has led to the supposition that the country was more unhealthy than, in fact, it is.

The following, from Birkbeck's Notes, is a lively picture of Western life in some positions ; exhibiting the effect of a situation like that above-mentioned :—

“ Our journey across the Little Wabash was a complete departure from all mark of civilisation. We saw no bears, as they are now buried in the thickets, and seldom appear by day ; but, at every few yards, we saw recent marks of their doings—‘ wallowing ’ in the long grass, or turning over the decayed logs in quest of beetles or worms, in which work the strength of this animal is equal to that of four men. Wandering without track, where even the sagacity of our hunter-

guide had nearly failed us, we at length arrived at the cabin of another hunter, where we lodged.

“ This man and his family are remarkable instances of the effect on the complexion produced by the perpetual incarceration of a thorough woodland life. Incarceration may be a term less applicable to the condition of a roving backwoodsman than to any other, and especially unsuitable to the habits of this man and his family : for the cabin in which he entertained us is the third dwelling he has built within the last twelve months ; and a very slender motive would place him in a fourth before the ensuing winter. In his general habits, the hunter ranges as freely as the beast he pursues. Laboring under no restraint, his activity is only bounded by his own physical powers. Still he is incarcerated—‘ shut from the common air—buried in the depth of a boundless forest—the breeze of health never reaches these poor wanderers. They are tall and pale, like vegetables that grow in a vault, pining for light.’

“ The man, his pregnant wife, his eldest son, a tall, half-naked youth, just initiated in the hunter’s art, and three daughters, growing up into great rude girls, and a squalling tribe of dirty brats of both sexes, are of one pale yellow, without the slightest tint of healthful bloom.

“ In passing through a vast expanse of the backwoods, I have been so much struck with this effect, that I fancy I could determine the color of the inhabitants if I was apprised of the depth of their immersion ; and, *vice versâ*, I could judge of the extent of the clearings if I saw the people. The blood, I fancy, is not supplied with its proper dose of oxygen from their gloomy atmosphere, crowded with vegetables growing almost in the dark, or decomposing, and, in either case, abstracting from the air this vital principle.”—*Notes*, 138, et seq.

This description of Mr. Birkbeck may not be exaggerated in reference to some portions of the population. Indeed, it strikingly reminds the writer of some specimens he has met with ; but it would lead to great error if taken as a picture of the country. In other situations, remote from the streams, and on high ground, particularly in the prairies, the country cannot be said to be unhealthy. In all parts of the country, it is true, the fever and ague and bilious fever are rather frequent ; but there is also an exemption from some of the disorders prevalent in other parts. The usual forms of colds, hoarseness, coughing, sore throat, and pulmonary affections, are almost unknown. Bilious disorders and affections of the liver are the diseases of the country ; but, it is believed, there has been less fatal sickness, and less of prevailing epidemics, than in most other portions of the country in the first settlement and turning up of the soil. The case described by Mr. Birkbeck was partly owing to situation, but more, probably, to habits of life, and privations and exposure.

Apart from the partial causes of disease existing in particular situations, arising from the exhalations of the rivers, the decaying vegetation of the bottoms overflowed and left dry, or the marshy or wet grounds which are not strangers to any country, there is no general unhealthiness in the climate itself. The atmosphere of the country is in an unusual degree adapted to the preservation of health ; as is proved by its effects upon the throat and lungs. The prairies send not forth pestilence ; and what is purer than the breeze from the lakes ? The temperature is variable, it is true ; but the air is arid and the circulation free and brisk, and these qualities forbid that the great and sudden vicissitudes should create disease. These changes are sometimes so great in a brief space as to be incredible. The writer is conscious that it requires an easy faith to believe the assertion that he once

knew Fahrenheit to fall from 52 plus to 4 minus in twenty-four hours.

The greatest degree of cold in a winter is greater here than on the Atlantic in the same latitude, as the philosopher would judge from his science, without the testimony of a witness. The great reservoir of latent caloric, in the deep bed of the Atlantic, must of necessity mitigate the extreme rigor of the atmosphere from the earth. In a residence of sixteen years on the Mississippi, the writer thinks that no winter passed when the thermometer did not go as low as 24 below zero, by Fahrenheit, in lat. 41° to 42° . There is not, however, a great deal of snow in the winter, nor is there generally much rain in the summer. In most of the seasons within the writer's observation, the crops would have suffered by drought, if it had not been for the abundant dews.

The spring is a shorter season here than east of the mountains. Wild flowers make their appearance from the 10th to the 15th of April. The fall is a most delightful season. The heats of summer correspond exactly, measuring by the thermometer, with other places in the same parallel. But the atmosphere is not so dense, and of course the heat has a greater effect upon the human system, and the rays of the sun, coming with less refraction, produce a stronger glare upon the eye, as well as a more scorching heat in the veins.

Next to the air in preserving health, perhaps superior to it, is pure water. This is a limestone country, and of course all the water is impregnated with this stone. The writer is no physician;—but he considers a limestone water as particularly favorable to health. The water is of an agreeable taste, pleasant, and very clear. But the inhabitants have a very disgusting practice of drinking from the rivers and running streams, into which every unclean thing enters. The bucket is thrown from the steamboat within one or two rods of the

crypt that serves one or two hundred persons. All the dwellers on the banks carry their water from the same polluted stream. And if a more fortunate resident on the banks of a creek drinks from a less vitiated source, yet this is not without its share of decaying vegetation and other matters injurious to health. This is a surprising inattention to comfort and decency, as well as to health, when it is known that a pure spring may generally be struck at twenty or thirty feet from the surface.

If with this impure and unhealthy habit, joined to the exposure from the dwelling, from its insufficiency as a shelter, from unaccustomed labors and hardships, and from the exhalations of undrained and of newly cultivated country, the amount of sickness and of mortality is not more than double the amount in a like population in other parts, the climate of the country ought to be considered salubrious.

A few remarks extracted from "Peck's Guide to the West," inserted in that work as a quotation, have the concurrence of the writer :—

"Much disease, especially in the more recently settled parts of this country, is consequent to neglecting simple and comfortable precautionary means ; sometimes this neglect is owing to misdirected industry, and at others to laziness or evil habits.

"To have a dry house, if it be a log one, with the openings between the logs well filled up, so that it may be kept warm in winter ; to fill up all the holes in its vicinity which may contain stagnant water ; to have a good clean spring or well, sufficient clothing, and a reasonable supply of provisions, should be the first object of a settler's attention. But frequently a little wet smoky cabin or hovel is erected, with the floor scarcely separated from the ground, and admitting the damp and unwholesome air. All hands that can work are

impelled, by the father's example, to labor beyond their strength, and more land is cleared and planted with corn than is well tended; for over-exertion, change in the manner of living, and the influence of other debilitating causes, bring sickness on at least a part of the family before the summer is half over.

* * * * *

"Many persons, on moving into the back woods, who have been accustomed to the decencies of life, think it is little matter how they live, because no one sees them. Thus we have known a family of some opulence to reside for years in a cabin unfit for the abode of any human being, because they could not find time to build a house; and whenever it rained hard the females were necessarily engaged in rolling the beds from one corner of the room to another, in order to save them from the water that poured in through the roof. This cabin was intended at first as only a very temporary residence, and was erected on the edge of a swamp, for the convenience of being near to a spring. How unreasonable must such people be if they expect health!"

THE PUBLIC LANDS.

THE immense body of unappropriated and unsettled lands in this country, comprising more than 270,000,000 acres,* is commonly denominated government lands, and in all action upon them, both by individuals and by public bodies, legis-

* By the returns in the Land Office, dated June, 1845, which is the latest return, the whole amount purchased of the Indians, and yet in the hands of the Government, not granted to individuals, surveyed and unsurveyed, amounts to 272,825,055 acres. At the time of writing this note, a treaty, just concluded with the Potawatamis, and also another, are before the Senate. These will probably make the amount about 300,000,000 acres.

lative or judicial, they are treated as the property of the government ;—as if the government held them in fee simple.

Such an idea of an estate in fee in the government cannot, however, be sustained upon any recognized principles of political law in this country. In England, it is true, the doctrine formerly obtained that the property of all the lands in the realm was vested in the crown, and that the king might dispose of them as pleased him, without restriction.. Under our government an original tenure in fee of the lands within the national domain, has never been acknowledged as an incident of sovereignty, or as in any way an attribute or prerogative of the government. The government with us is considered to have neither power, domain, prerogative, property, nor revenue, but as trustees for the States, and expressly given by the constitution.

Such dominion as the government have over the public lands is not original, but acquired—it gives them not an estate in fee, but an interest in nature of a right of possession with a lien or mortgage, for the payment of the expenses of extinguishing the Indian title, of surveying and of bringing into market ; and that interest not in the nature of a usufruct, but fiduciary.

The Indian nations who formerly inhabited or roamed over these lands knew nothing of separate property, nothing of estates in fee, or less—they recognized no tenure, or investiture of title. Their claim was to a right of hunting. By their treaties they give up that to the government of the United States. And it is all they have to give. They cannot convey more. They cannot convey what they do not possess. They do not convey any absolute title, but relinquish their claim, which is a right of possession merely. No person, or body politic, or community, can convey to another what such person or body has not in itself : nor can any grantee acquire

any title by grant from another which the grantor did not possess.

What is the Indian title? It is mere occupancy for the purpose of hunting. It is not like our tenures. They have no idea of a title to the soil itself. It is overrun by them, rather than inhabited. It is not a true and legal possession. [Vattel, b. 1, § 81, p. 37, and § 209, b. 2, p. 96. Montes., b. 18, ch. 12. Smith, *Wealth of Nat.*, b. 5, ch. 1.] It is a right not to be transferred, but extinguished: regulated by treaties, not by deeds of conveyance. It depends upon the law of nations, not upon municipal right. [J. Q. Adams, *Fletcher vs. Peck*, Cranch, vol. 6, p. 121.]

But beside that the Indians have no idea of individual property in the land, and pretend to no right but as a community, and that founded on a residence or occupancy, that residence itself is not of a permanent nature. They occupy only till they find a more convenient spot, or till they are driven from the one which they select by some neighboring hostile tribe, and then seek another hunting-ground in the vast expanse of unoccupied country before them. In this way the Sauks have passed from the lower waters of the St. Lawrence to the Mississippi. Their last occupation of the mouth of Rock River and the western bank of the Mississippi, was made at the period nearly of the American Revolution, when they were driven south by the Chippewas. It is only about ten years ago, as stated by Nicollet, that the northern Chippewas drove the Sioux to the south of their old limits, and compelled them to pitch their tents some hundreds of miles farther, stretching to the west and south of the Missouri.

If, however, it were otherwise, society could not allow that a small community of 5,000 or 6,000, if civilized men, claiming property in severalty, and by a permanent tenure,

should occupy exclusively a territory sufficient to sustain ten millions of people.

These lands are then in the state in which all lands are originally, and the title to them is to be acquired in the same way in which all titles are at first acquired, by occupancy ; which is as good as title by deed, and better, as an original is better than a derivative title, which all titles by deed are, and which must be resolved ultimately to an original title by occupancy. The settler, then, has a good title to these lands, against all the world, but the government, absolute—and against the government upon the condition of paying the lien for expenses, which has been fixed at \$1.25 per acre. The government neither has, nor can it acquire, by any principle known to the law, a fee simple in the lands. The only way in which it can be acquired is by the settler, by occupancy.

Title by occupancy is not only a legal and valid title, but it is the *only* title by which lands are or *can be* originally held, except where the English doctrine holds, which gives them to the king. In this country they are held by the law of nature until relinquished by the bands of red men, who have resided on them, and then, not belonging to the government as by the English law they belong to the crown, are open to the first occupier

Occupancy is the true ground and foundation of property, or of holding those things in severalty, which, by the law of nature, unqualified by that of society, were common to all mankind.—Black. Com., v. 2, p. 158 ; ib., p. 8.

This is not depending on the authority of Blackstone alone, but it is also the doctrine of Grotius, Puffendorf, Locke, Rutherford, Vattel, Montesquieu, Burlamaqui, Smith, and others, who have treated of natural and political laws.

The writers upon natural law say that originally all things

were in common. That primarily and originally all the people who were upon the earth had an equal undivided right in the earth and the things that were upon it. Some of these things were by nature incapable of a property in them, that is, of a dominion and ownership by one man, to the exclusion of the rest;—such as the ocean, the air, &c., these must remain in common. Other things are capable of exclusive property in an individual, as the earth. The original community of goods in these things that were capable of ownership would become, they say, inconvenient as mankind increased and society progressed. Under this condition of things, “the most effectual way,” says Rutherford, “of securing the peace of mankind is by introducing an exclusive property. * * * The common claim which all men originally had to all things is taken away by the introduction of property as far as this exclusive right extends. * * * * When mankind were few in number, and lived together in the same place, they could easily meet to divide their common stock, and to assign to each other his proper share by *express consent, agreement, or compact*. But after their numbers were increased, and they were settled in different parts of the world, very distant from one another, it became impossible for all of them to meet together. This method therefore of introducing property by express consent was rendered impracticable. Some consent, however, has been shown to be necessary to make the introduction of property consistent with justice; and a tacit one would be sufficient for that purpose. Such a tacit consent is called occupancy. Indeed occupancy is but one part of the act.” The other part of the act, as stated by Rutherford, is the consent of the rest of mankind, and this consent is presumed if they do not assert their common right and interfere with his occupancy.

"Upon the whole then," says Rutherford, "property cannot be introduced consistently with justice, unless by the common consent of mankind. The consent which is necessary for this purpose might either be given expressly when all mankind could meet together, and such agreement is called division;—or else it may be presumed, in consequence of the future proprietor having, without molestation, taken and kept possession of the thing which he intends to make his own, and such a tacit agreement is called occupancy."

"But though either division or occupancy might give property in the first ages of the world, when all the joint commoners could meet together, the way of introducing property by division is now at an end. The great numbers of mankind, and their remoteness from one another, have rendered it impossible for them all to meet, and to divide the common stock of goods, or such parts of the common stock as have not yet been appropriated. *There is therefore at present no other method left for beginning property but occupancy only; all things which were not appropriated formerly, must now be appropriated by occupancy or not at all.*"—*Ruth. Ins.*, v. 1, p. 42 to 50.

Mr. Locke goes much farther. He does not consider any consent, express or tacit, as necessary on the part of the rest of mankind. But he places the right to property by occupancy, absolutely in the act of taking possession and improving, on the ground that a man has a property in the labor of his hands; and this labor being bestowed on an unappropriated thing, makes it his own.

The Indian lands in this country are in the condition asserted by Rutherford of all lands originally. They are held in common. The common claim is not taken away in them by the introduction of property. This stage of things has not yet arrived among the Indians. Under this condition

the lands are transferred to our government. Before their transfer, thousands of years before, the principle of occupancy as giving a title to such common unappropriated lands has been established as a fundamental principle in the original acquisition of property. These lands, therefore, are a subject for the application of the principle; and they become the absolute property of the individual who occupies and improves them.

Rutherford says that before this right of property by occupancy can attach, it is necessary the "*thing seized upon should be certain and determinate.*" In the case of the public lands, it is always understood to be a quarter section of the public survey. This renders it determinate. But I would add one other condition, and that is, that it is necessary also for the occupant to pay to government the expenses of the Indian treaty and the survey. These two conditions complied with, and I believe it impossible to establish any other principle known to the doctors upon natural or politic law, whereby a title to these lands can be acquired, and wholly impossible to show any fair and solid argument against the equity and legality of the title by occupancy,—or the propriety of its application to the lands in question.

If Congress, unmindful of this law, and treating the public lands as if government had the fee in them, shall continue obstinately to persist in the illiberal policy which they have maintained, and which is founded no less upon ignorance of facts, than upon error in law, the time will come when the settlers will disregard the lien of government, and take possession of the lands without refunding the expenses of the treaties and surveys.

A permanent pre-emption law was passed in September, 1841, by which the occupants of the public lands are secured in their possessions—and every person being the head of a

family, widow, or single man, over the age of twenty-one years, a citizen of the United States, or who has filed a declaration under the naturalization laws, to become a citizen, who shall make a settlement on the public lands in person, and inhabit and improve the same and erect a dwelling-house thereon, shall be authorized to enter a quarter section of 160 acres, or a less legal subdivision, at the Land Office of the District.

The title by occupancy is thus limited by the enactment of the legislature, which defines the extent which the occupancy may cover;—and, at the same time, to that extent, fortifies and confirms the title.

The system of public surveys is a very complete admeasurement and marking of the whole body of public lands. As soon as the claim of the Indian occupants is extinguished, the land is first run off and marked in township lines, which are divisions of six miles square. Afterward the township is divided into sections of one mile square, each section and quarter section being marked, by blazing a tree, as the technical phrase is for marking it with an axe; or, if the corner to be marked is in the prairie, by driving a stake and throwing up a sod, marking at the same time on the tree or the stake the number of the township and section. The townships are numbered from south to north on a base line, and the north and south ranges are numbered on both sides of an arbitrary meridian, east and west. The sections are numbered, beginning at the northeast section of the township for number one, running west, and alternately east, terminating with number thirty-six in the southeast corner. Section numbered sixteen in each township is appropriated to schools, and transferred to the States for that purpose.

Those lands not entered under the pre-emption law, are offered at public sale, previous to which no other person, not

having a pre-emptive right, can purchase. After they have been offered at public sale, they are open to every purchaser at private sale.

The price of all the lands is fixed at a uniform minimum of one dollar and a quarter per acre. A bill is now before Congress, providing for the graduation of the prices of those that have been a long time in the market. The graduation of the price of public lands, and a liberal permanent pre-emption law, are objects of the greatest importance to all the west.

In the year ending December 1, 1844, 6,693,368 acres of new land were offered in the market, beside a great amount that was then on hand that had been previously offered: of this amount 1,747,158 acres were sold, mostly in small subdivisions of 80 and 160 acres—an excess over both the preceding years. In 1843, the number of acres sold was 1,605,264.

There has been a great misunderstanding on the part of the executive branch of the government, in relation to the value of the mineral lands. Mr. Spencer, when Secretary of War, in his annual report (1843?) stated the value of the mineral reservation in the lead district at \$50 per acre!!! and recommended their sale at an extravagant sum (\$20) as the minimum. Now, the statement already made of the annual proceeds of these lands, shows them to be of no greater value than farming lands; and if they were put up for sale to-day, at the minimum of \$1.25 per acre, a great portion of them would remain unsold. A law has passed Congress at the present session to offer these lands for sale at a minimum of \$2.50 per acre. Under this law but a small portion of the mineral reserve will be sold to actual miners, who know its value, though perhaps a good deal may be disposed of to unwise speculators.

The proposition has sometimes been suggested of ceding the public domain to the States respectively, in which it is included, at a certain price per acre (say 50 cents, or whatever the net proceeds may be under the control of the United States government), to be paid on the receipt of the proceeds of sale. The advantages of this plan would be, reducing the patronage of the national executive very considerably; and giving to the State governments in some degree the control of the lands; who would have power to modify the policy of the land system so as to favor or retard the settlement of their own State. The objections to it, among others, would be that it might lead to collisions between the State and National governments, and that the stipulated price (of 50 cents per acre) would never be paid to the United States. This last objection could be obviated by making the land officers bound to the United States, as well as to the State, and requiring them to pay its portion immediately to the United States, without first going into the State Treasury, and giving an action against them to the United States for its recovery. Perhaps such provisions would exclude also the danger of collision between the general and the local governments. One other benefit would arise from it. It might be managed with better understanding, and more economy, by the State governments, and some revenue saved by them for improvements.

Under such a plan, moreover, the difficulties attending the settlement of conflicting or doubtful claims, would easily be overcome. There are now between one and two thousand cases of suspended patents, or undecided claims, in the land office, many of which have remained so for years, and which never can be settled without additional legislation of Congress. The number of land officers in the United States is 134, subject to reappointment every four years, in the eight

surveying districts, and sixty-three land offices ; beside sixty or seventy officers and clerks in the City of Washington. All this executive patronage may be dispensed with by the proposed system, except about a corporal's guard at Washington. The knowledge that would be brought into the administration of the land laws by the change, would be a great consideration. By the intimate knowledge which the State Governments have of this interest, a standard for the graduation of prices might be attained, much more accurate than that of mere time. If the surveys were made under the authority of the States, a farther economy may be made in that part of the business, probably. But if the surveys should be made by the United States, the eight Surveyors General, and a large number of officers at Washington, could not be dispensed with.

P A R T V.

INDIANS.—MONUMENTS.

THE Indian tribes now inhabiting the country under our consideration are the

Chippewas, inhabiting the country toward the sources of the Mississippi, above St. Peter's, and toward Lake Superior. With a small band of less than 200 inhabiting about Black River, they amount to - - - - - 7,780

The Menominies in Wisconsin, - - - - - 2,508

The New York Indians, " - - - - - 3,293

Oneidas of Green Bay, - - - - - 720

Potawatamies of Huron, - - - - - 100

Stockbridge of Green Bay, - - - - - 207

Stockbridge and Munsee, - - - - - 388

Dahcotahs (Sioux), - - - - - 25,000

Winnebagoes, - - - - - 2,183

Potawatamies, - - - - - 2,200

44,379

Perhaps the Oneidas, Stockbridge, and Stockbridge and Munsee are included in the New York, and if so, they are repeated, and there should be deducted from the above - - 1,315

43,064

The whole number is therefore, in that case, about 43,000. Of these the greater part, the Sioux, Potawatamies, and the

Chippewas of the Mississippi, amounting to about 35,000, are at a distance from the white settlements, and have but little intercourse with them ; and about 8,000 or 9,000 are near the whites, and either reside among them or frequently visit them. The Sauks and Foxes, about 2,000, left this district last fall, for the land allotted them by the government southwest of the Missouri. There are several small tribes on the west bank of the Missouri ; and high up that stream the Mandans, Arikarees, and Blackfeet, occasionally pass east of the river, and roam over parts of the district comprehended within our pages. The Blackfeet reside partly within it.

The early French travellers to this region mention many tribes who have now disappeared ; some of whom have been known in later times, and others who perhaps have not been heard of except through them.—Charlevoix names the Octotatas,* otherwise called Mactotatas, near the mouth of the Missouri, and the Moingonas, on the river of that name ; also, the Peorias, Tamaroas, Caokias, Kaskaskias, and Mitchigameas, who were tribes of the Illinois ; Mascotins and the Saulteurs of St. Marie, whose name he gives in their own language as Pauoirigwiwhac, the Nokets on Green Bay, the Ochagras, and the Kickapoos, are frequently named, and the Outagamis, who are the Foxes, and are now called by themselves Muskwakas. The Isati were mentioned as inhabiting about the Falls of St. Anthony, and perhaps have that name by corruption from Saulteurs, which seems also to have been applied to them. They are probably the Chippeway. It is said by some that the name of the river Theakike was taken from a tribe of that name. All the travellers have spoken of the Naudoessies, so they spell it, who seem to have been the Dacotas, the name applied to them being no other than their

* They are called by others Ottoetatas, and may be the people now called Ottoes.

own way of speaking Nord-ouest, the name of description used by the French, though singularly enough, they did not recognize it in the Indian change, but received it as an original Indian name. It may easily be conceived how the name became fixed on them. When they visited the French settlements, as all the tribes in this quarter did, and described the place of their residence, the French themselves applied the word Nord-ouest, in reference to the situation of their country. In their subsequent visits, to make themselves known from the other numerous tribes who visited them, they used the word which the French had applied to them, as a much more intelligible description to *them* than their proper name; and their pronunciation of it was Nordouessy. The term thus became an appellative, which the French mistook for an original name.

There was a tribe also called Massisagua, or Massisakwa (for it is not easy to distinguish accurately the Indian sounds), which is the name by which they call the prairie-rattlesnake. The first half of the word is the same as the name of the river, and means, great. The whole word may, therefore, mean, great adder. The last portion of it is, perhaps, the true name of the tribe which we now call Sak, and Saki.*

The French make strange work in writing an Indian name. Ottawas, they make Ouctawaks; Wabash, Ouabache and Ouabaskigou.

Hennepin puts down the Tintonhas on the St. Peter's, and Hancton (Yanckton) further north on the Mississippi.

Lahontan enumerates, on Lake Huron, the Hurons, Outawas, Nockes, Missisagues, Attikamek, Outchipoues (Chippewas), or Sauteurs (of St. Anthony). On Illinois Lake (Lake Michigan), Illinois, Oumamis, Maskoutins,

* See Note on p. 118.

Kickapous, Outagamis, Malominis (Menominis), Pouteoutamis, Ojatinons,* Sakis ; and, north of Mississippi, Naudoeessis, Assimpouls (Assiniboins), Sonkaskitons, Atintons, Clistinos, Eskimos. To the west, on the river called Long River, which is St. Peter's valley, he mentions the Panimoha (Pawnee Maha), now on the Missouri ; Okoros, or Eokoros, near the mouth of Long River ; Essanapes, sixty leagues further up the river ; and the Gnacsitaires, still further up. He says : the Eokoros had twelve villages and twenty thousand warriors ; and that they were much greater before their recent wars. He describes the Mozemlek Indians to the *west*, on a river which, at one hundred and fifty leagues from his place on Long River, discharges itself into a great salt lake, three hundred leagues in circumference, having at its mouth six large *walled* towns, and many others around the lake. The people around this lake call themselves Tahuglauk. All this was reported to him by the Gnacsitaires, and was, no doubt, not correctly understood. The River Chayen-oju *comes from* a salt water region, to the north, and empties into the Red River. The Mozemlek may have lived on that, or on the Red River, which *discharges* itself into Hudson's Bay. The final syllable of their name may have been mistaken for lac, the whole name being derived from some lake in that vicinity. There is a band called Esconabe, to the north and east, in Canada, who may be the same as the Essanape. Both the Mozemlek and Tahuglauk are described as wearing beards and clothing. Charlevoix also relates that he received information of some Indians inhabiting about the Great Lake in the Northwest, which has been before mentioned, who wore buttons on their clothes, and looked like Frenchmen. I must repeat my belief in the probable occur-

* This is spelt, by Charlevoix, I think, Ouiatinons (Weatinons), and may be the tribe of the Miamis now called Weas.

rence of some great convulsion of nature, which has destroyed both lakes and men, since that country was first seen by the whites.

The Wahpacootas, a band of the Sioux, or Dacotas, now dwell where Lahontan found the Eokoros; and, higher up, where he found the Essanape and Gnacsitares, are the Wapetons, another band of the same nation. Farther west are the Yanctons, and beyond, the Teton, or Titonwan, and Yanctoni, all bands of the Sioux. Farther in the north and west are the Chippewas, Assiniboins, Blackfeet, Mandans, Arrikarees, Gros Ventres, and Arripahas.

There are eleven bands of the Dacotas. Five of them are named in the last preceding paragraph. The others are the Medawekantons, Sisseton, Santis, Sioune, Ogallala, and Hunkpapa. From the name of one of these bands, probably Sioune, the French called the whole Dakota nation Sioux. Formerly, the Assiniboins were a tribe of the same nation, from whom they separated.

A tribe was mentioned, by all the travellers, under the various names of Klistinos, Knistinos, and Kristinos.

The Illinois, a powerful nation, occupied the northeastern portion of the tract comprised within our limits, residing on both sides of the Illinois River for nearly the whole extent of the State, north and south, and from the Lake to beyond the Mississippi. They were divided into several bands, under the names of Tamaroas, Michigamis, Kaskaskias, Kahokias, Peorias, and Moingonas. Of this numerous and powerful nation, the only remnant is a band of Kaskaskias and Peorias, numbering about one hundred and fifty. By long and bloody wars with the Iroquois, before they were known to the whites, the Illinois nation had become much reduced and enfeebled. The cession of Louisiana by France to Spain and England, by partition, in 1763, caused much dissatisfaction among the

numerous Indian tribes, and eventually led to wars among themselves, which resulted, mediately, in the almost total extinction of the Illinois. Pontiac, a celebrated chief of some of the lake tribes, perhaps Huron, had endeavored to stir up all the nations of Northern Louisiana and the lakes to resist the transfer of dominion. He was afterward murdered by a Kaskaskia; and, in revenge of his death, his friends made war upon the Illinois, which nearly destroyed the latter nation. Of the small remnant, a part were cut off by the Sauks, in the beginning of this century. To the north of the Illinois were the Saukis, on the Wisconsin River; the Potawatamis, at Green Bay, together with the small band of Nokes; and, further up the Fox River, the Musquakis, called, by the Chippewas, Outagamis, now the Foxes; and, to the north of that river, the Menominis, who remain there to this day; and, between there and Lake Superior, some of the Chippewa bands. The Winnebagos are not mentioned by that name. Nor do we hear of the Dacotas, or of any of that nation, by the names they now bear; but, from the place of residence, it is probable that those visited by Lahontan were different bands of this nation.

The Menomini country, at present possessed by them, is bounded by the Wisconsin River to the west, the Fox River south, the Wolf River to the east, and on the north by lands lately ceded by the Chippewas to the United States, by treaty of 1842. The Nokes, at the earliest mention we have of them, consisted only of a few families, scattered here and there, but mostly frequenting the bay of that name in the northwest part of Green Bay. The Malominis, says Charlevoix, have a single village only, on the river of that name. They are a very handsome race, and the best-made of all the nations inhabiting Canada. They are larger than the Potawatamis. I am assured that they have a common origin with

the Noquets and Saulters, and also a language similar to theirs. But they say that they have also a peculiar language of their own, which they keep to themselves. [*Char.*, vol. 5, p. 430.] Long says they are of a very light color, and that even before their admixture with the French, they were lighter than their neighbors,—and they are often called the White Indians.

The Saukies, though small in number, are divided into two factions, of which one is attached to the Outagamis, the other to the Potawatamis. [*Char.*, vol. 5, p. 432.] When the whites first came to the St. Lawrence, the Saukis were living in the country about its mouth. They afterward migrated to the west, and were found by Hennepin about the bend of the Wisconsin River. They probably extended northward to the Chippeway grounds: as they subsequently had a difficulty with that nation, which resulted in the removal of the Sauks to the south, and their establishment on Rock River. It appears, however, that in retiring south they did not yield their possessions on the Wisconsin, which they subsequently sold to the United States. The contest by which they were driven from the Wisconsin to the Rock River may have been about the time of our revolution, as Long and Maj. Marston agree that they came to the latter place at about that period. Here a portion of them resided at the breaking out of the war of 1812, and still remained till the Black Hawk war in 1832. A part of the tribe left the Rock River settlement about the beginning of the present century, and took up their residence on the Missouri, where they have since remained. Some of them have been mixed with the Potawatamis. And the Shawnees are descendants of a seceding band of Sacs. The main body, formerly numbering about five or six thousand, gave up their Rock River lands to the whites, and removed west of the Mississippi, which cession was the cause

of the Black Hawk war. They resided between the two rivers till the last fall (1845), when, according to their treaty of 1842, they removed west of the Missouri.

Mr. Schoolcraft gives the following sketch of the contest with the Chippewas, by which they were compelled to retire south :

“ The St. Croix River, at the falls (says Mr. Schoolcraft), is the battle-ground of Wahbojeeg, a celebrated Chippeway war chief of the last century, and testifies to an event in Indian tradition. Like most of the incidents in Indian warfare in this region, it is connected with the restless spirit, erratic adventure and ambitious daring of the tribes who are this season (1832) arrayed in hostility to the settlements on the Wisconsin. It is one of the links of the curious train of history of the Sauk and Fox tribes who have fought their way from the St. Lawrence thus far across the continent, and been successively embroiled with each of the white powers, and perhaps with some exceptions with each of the Indian tribes of the north. They appear by their language and traditions to be Algonquins, and may be traced, as a starting point, to the north shores of Lake Ontario. They appear to have been driven thence for perfidy. They lived long at, and gave the name to Saganaw. They went to the Fox River of Green Bay, which is named after them, and here embroiled themselves with the Menomones, the Chippewas and the French.* They were finally driven thence by force of arms. They fled to the Wisconsin, where Carver

* It does not appear on what authority Mr. Schoolcraft gives the above relation. The character of the Sauks or Musquakas is not perfidious. It is true that the Sauks, if not the Foxes, came from the lower St. Lawrence, below the lake. But when the first French visited Green Bay, prior to 1700, they found there the Outagamis or Foxes, and at the portage the Sauks. The union of the two bands more probably occurred there, after a contest between them for possession of the country.

speaks of their villages in 1766 ; thence to their recent residence on Rock River, and by the last tragic act in their history, are confined to a limit commencing west of the Mississippi. We speak of the Sauks and Foxes as connected in the gauntlet-like warfare they have maintained ; for they appear to have been intimate allies from the earliest times. The Indian name of the one tribe signifies those who went out of the land* (osaukee), and the other Redearths (Muskwakee), known by the nom de guerre of Foxes.

“ While resident at Green Bay they occupied also Lac du Flambeau, and extended themselves to Lake Superior, and southwest of its shores, to the Sauk and Little Sauk Rivers above the Falls of St. Anthony. While thus located they seem to have fallen out with the Chippewas, and leagued with the Sioux, whom they have of late so strenuously fought. With the aid of the latter, at first covertly given, they maintained the possession of the rice lakes and mid-land hunting grounds. But they were finally overthrown in a general defeat at these falls by the combined Chippewa bands of Lake Superior. The latter came down the St. Croix by its Namakagon branch. They were led by Wahbojeeg. Their spies reached the falls without having encountered an enemy, but they unexpectedly found the Foxes (whom they called Ootaighamees), with their allies, encamped

* Mr. Schoolcraft is probably nearly right in the etymology of the names Sauki and Musquakie. In a note to the relation furnished by Maj. Marston, at the end of Dr. Morse's Report to the Secretary of War, it is said, that Saukie means red bank, and Musquakie yellow bank,—undoubtedly an error. Kebesaukie is the name for peninsula. The last half of the word therefore probably corresponds with the last half of peninsula, and means island, which is “ *out of the land*,” or a place in the water, given to them probably because of an insular residence at some time in their history. This was my own idea of the etymology of the name before I saw Mr. Schoolcraft's version. Mus mean red,—and he may be right in the derivation of Musquakie.

at the other end of the portage. A partial action ensued. It was rendered general by the arrival of the whole Chippewa force. It was a fierce and bloody action. The Foxes made a resolute stand. But they were overpowered and fled; and they have not since reappeared in that region. Among the slain several Sioux were found; and this is said to be the first actual testimony of the Sioux being leagued with them in the war against the Chippewas. But this assertion is hardly reconcileable with the date of the war in other places. Wahbojeeg or the White Fisher, who is noticed as the leader on this occasion, is said to have led out seven other expeditions against the Foxes and Sioux. He died at Chegoimegon, in Lake Superior, in 1793."

The Sauks and Foxes took no part in the war of 1812. A body of them left their place on Rock River, and went to the Lake and offered their services to the British. But taking disgust at the atrocities of some of the allies practised upon the Americans, they soon returned to their village, and remained inactive during the war.

They are generally a tall, well-made people, with faces expressive of more intellect than would be found in an equal number of whites taken by chance, even with the advantages which the latter possess in education. In character and manners they are very respectable and dignified. Brave, pacific, hospitable, honest and generous; the condition of civilisation, the habit of industry and the discipline of education, would make them equal to the best men in any country. Their ideas of the social duties are very good; and it is the custom for one of their principal men to go through the village daily, at sunrise, exhorting all to do good. Wennebea, who accompanied Maj. Long, was a Sauk of a reflecting and judicious mind, and of a moral disposition.

Major Long says, with a view to ascertain what were

their (the Sauk) ideas of moral excellence, we asked Wennebea what, in their opinion, constituted a good man. He immediately replied, that, "in order to be entitled to this appellation an Indian ought to be mild in his manners, affable to all, and particularly so to his squaw. His hospitality ought to be boundless. His cabin, as well as all that he can procure, should be at the disposal of any one who visits him. Should he receive presents, he ought to divide them among the young men of his tribe, reserving no share for himself. But what he chiefly considered as characteristic of a good man, was to be mild and not quarrelsome when intoxicated.

* * * * *

"It is the duty of a good Indian to offer sacrifices to the Master of Life. The business of men consists in hunting, fighting, building their lodges, digging their canoes, taking care of their horses, making wooden spoons, &c. ; while it is the duty of the women to hew wood, to carry water, to plant and raise corn, to take care of their families, and, in the absence of the men, they must attend to their horses, build their lodges, &c. Man's chief and best occupation is hunting. He will never fight unless aggrieved by his enemies, in which case it becomes his duty to resent the injury. A good hunter is held in high esteem, and will obtain as many wives as he chooses, because they know that he can support them, but the good warrior is esteemed the first man in the nation.

"A woman, in order to deserve the appellation of good, ought to be endued with most of the qualities which constitute virtue among civilized females. To be obedient and affectionate to her husband is her first duty. Kind to all her children, partial to none : affable and courteous to all men, avoiding however the appearance of familiarity with any. Her chastity should be inviolate, even at the risk of death.

She ought to be industrious, in order that her husband may be wealthy, and able to extend his hospitality widely.

* * * *

“Wennebea thought that when the Master of Life made the white man, he gave him the power to improve in knowledge and the arts : he taught him how to manufacture all the articles that he wanted, such as cloth, guns, &c. To the red man he gave nothing but his bow and his dog, intending him therefore for no other occupation than that of hunting.

“This appeared to be a favorite idea with Wennebea, and from it he drew the inference that the red man was predestined to remain stationary, and to live by hunting.

“There is probably a similar system of ethics to that above explained by Wennebea, adopted by most of the red nations in the valley, though there is a diversity of national traits ; and the habits and conduct of all may not conform equally well with the standard fixed by their principles. There is also, of course, every shade of individual character, as among the whites. It is very common for white men who go among the Indians, or meet with them, to judge of the character of the tribe or nation from the character or act of an individual ; and the traveller who loses any of his chattels among a company of red men, reports the nation to which they belong as a nation of thieves. That is as sensible and just as if a party of Indians on a visit to Washington, or New York, should be robbed of some article, and upon that circumstance should say that the Americans were a nation of thieves.

“The red man has usually a great deal of sagacity, shrewdness, cunning, and practical wisdom, in part resulting from his want of education. The same thing is observable from the same cause in the white man. Those who study men instead of books, acquire a greater sagacity than those who read much, for the reason that they who devote their time to

books, have the less for observation of men ;—and those who meddle not with books, have no object upon which to direct their observation but men, apart from their attention to their particular art or pursuit.

“ Early in the 18th century a French trader, who went out to the country of the Missouris, made them acquainted with fire-arms, and sold them gunpowder and muskets. With these new weapons their success in hunting was greatly increased, and they obtained plenty of game and much fur. Another trader went to them afterward with gunpowder, but the Indians being supplied did not wish to purchase. The trader invented a plan to sell his stock to them. The Indians inquired how powder was made in France. He made them believe that it was sown in grounds similar to their prairies, and that they had crops of it, as of some grain which was known to the Indians. The Missouris were pleased with the discovery, and sowed their gunpowder, and were obliged to buy of the Frenchman all he had, to make up their supply for hunting. The trader did not remain till harvest : but the Indians soon found out the trick. Fearing to return himself, the Frenchman sent his partner out with goods to trade with the same people, as the profits of this traffic were too great to be abandoned. The Indians found out that he was associated with the one who had duped them. They gave him the public hut in the middle of the village to deposit his goods in, and when they were all opened and unpacked the Missouris came, and those who had bought gunpowder of his partner took some of his goods ; and the Frenchman found himself soon relieved of his stock in trade, but without receiving an equivalent. He complained to the chief, who told him with great gravity and dignity that he should have justice done to him, but for that purpose he must wait for the gunpowder harvest ; that his subjects had no means at pre-

sent of paying, but that after that harvest was over, he might rely upon the word of a chief, he would order a general hunt, and that the skins that should be taken, should be used to pay him for his goods, and for the important secret his partner had communicated to them." [*Bossu*, i., 146, et seq.]

The Dahcotahs are the most numerous, powerful, and warlike people east of the mountains, within the limits of the United States, except a nation called Pagans, who exceed them in numbers, but do not equal them in spirit and military power. They seem to have been at all times ready to lend their arm and draw a bow for other tribes, not as Swiss, nor requiring aid in return, but from a love of war. We find them going in aid of the Foxes to the attack on the Missigamis, about 600 or 700 miles; and again, a few years subsequent, taking part with the Sakis in that war with the Chippewas, when Wahbojeeg compelled them to leave their residence on the Fox and fix their wekeab on Rock River. They are the dread of all their weaker neighbors. They have, at several times within a few years, been embroiled with the Chippewas, the Poles of the north, whose wont is to stand, without regard to odds, and to fall every man on his track, rather than to fly. Besides the Chippewas they have, within a few years, had a difficulty with the Saukies, and they are now in hostility with the Potawatamis, Ottoes, Omahas and Pawnees.

The Chippewas, small in person, and of a quiet and meek aspect, have an indomitable spirit, and a prowess that shrinks from no encounter. They are greatly inferior in numbers to their neighbors, the Dahcotahs, and are moreover disunited and scattered, a part of them being joined to the Ottawas, and living east of Lake Michigan: that part within our limits being less than 8000.

The Winnebagoes, called by themselves Oshungulas, ac-

according to Maj. Marston, are poor, indolent, and filthy in their persons. They have the hatred of their white neighbors, who suspect them of taking their hogs, and, whether with or without cause, have fixed upon them the imputation of pilfering. They are on very good terms with the Dahcotahs, and of course fear not to be drawn into a quarrel with any of their neighbors.

The Potawatamis, though living at a distance from the whites, have less of the Indian characteristic than most of the other tribes. They are peaceably disposed, domestic in their habits, and some of them clothe themselves in the manner of the whites, especially the half-breeds.

The Iowas formerly inhabited a part of the country between the two rivers. They have now gone over the Missouri. They call themselves, as stated by Mr. Marston and others, I-ho-wa. They have a bad character. To questions put by Maj. Marston to the Sauks and Foxes, they answered that they were in alliance with the Iowas; stating, as a reason for it, that they were a bad people, and it was better to have their friendship than their enmity. The answer shows that the Sauks are, in their politics at least, very much like some other politicians that we know of.

In the Indian character generally there is the like diversity as among the whites. There are, however, some traits that are prevalent not only in tribes and nations, but which appear to belong to the red man wherever he is found, from the mouth of the St. Lawrence to the Rocky Mountains, and from the Gulf to lat. 49°. I believe it is common to them all to make the performance of their promise depend upon convenience and interest. This may be regarded as an Indian trait: though there are many of them who are faithful to their promises, under all circumstances, even to death.

The stories of Winona and of Ampatō Sapa show that the

female is capable of the heroism of love, of constancy, to death, and of a nature sensitive in extreme.

The history of former days, and occurrences of recent date, show that the warrior is possessed not only of animal courage, but of the truest heroism, and fortitude almost superhuman. The deeds that are related of Pontiac, the descent of the allied Sioux, Sakis, and others, upon the Illinois in 1752, and the contest of the Chippewas with the Saukis, and other events of past time in the Indian annals, show that they have not been surpassed in bravery by warriors of more enlightened nations. And the instances of recent occurrence show that the spirit of former days still lives with them.

Three years since a small party of sixteen Delawares and one Potawatami were hunting on the neutral ground between the Mississippi and Missouri. When they were about leaving their camp one morning, they were fired upon by a large party of Sioux, and some of their number wounded. They told the Potawatami to make his escape if he chose, but that they intended to fight by their wounded men, as long as one remained alive. They did so, and only the Potawatami escaped to tell the story.

More recently, a party of fifteen, of the same tribe, who were trapping otter on the head waters of the Kansas, were attacked by a large party of Sioux and Chiens. The Delawares stood their ground until the last man was killed. They are, says the Superintendent, the bravest of the brave. With this excess of courage, they are extremely forbearing, slow to resentment, and acting generally on the defensive.

Mr. Schoolcraft, speaking of the Indians of Cass Lake, says the Indians approached in their canoes in a body, with a welcome, which could hardly have been more cordial had we been old friends. They represented their residence to be on a large island bearing southwest from the entrance (Col-

caspi, or Grand Island). On approaching it a number of Indians were observed running across an elevation and pointing to a bay beyond. It was the best place of landing. They were assiduous in directing the men to the spot. They ranged themselves along the shore, fired a salute, and then came eagerly to the water's edge, giving each one a hand as he alighted from the canoe. He who has formed his estimate of an Indian from the reading of books, in which he is depicted as cruel and morose, without any insight into his social character, need only to be ushered into a scene like this to be convinced that he has contemplated an overshadowed picture. We found these Indians to be frank, cheerful, and confiding.

The present condition of the Indians in this region is very favorable. They have generally lands of most exuberant fertility, have farmers and blacksmiths residing among them by appointment of government, receive large annuities of money and goods, and have schools and religious instruction also provided at the expense of the government. Some of them cultivate the land, and are beginning to evince a taste for the arts and condition of civilized life. The Stockbridges and Brothertowns, living near Lake Michigan, have been naturalized, and become citizens of the United States. The Oneidas are improving their condition. Many of them are good farmers, and possess the comforts of civilized life. They attend church. The Chippeways, Dahcotahs, and Winnebagoes have schools. The Pottawatamies and Menominies are without any. The Sauks also had a provision for schools in their treaty of 1832. The government have also, in some of the treaties, stipulated for the establishment of mills, and these are maintained in some of the tribes, in addition to the farms and blacksmiths. Annual reports are made to the government by the agents, of the numbers and

condition of the Indians, accompanied by statements of the teachers, which show great numbers of the children are in attendance on school, and derive much advantage from it.

The condition of the Indians would no doubt be much improved if the operation of the laws were well understood, and their influence upon the circumstances and upon the disposition and character of the Indian were appreciated by those having the power to change them. But unfortunately, those who see them, if they are disinterested, are without the power to remedy them. If one not bearing official relations to the government or the Indians, should offer his counsel and communicate his knowledge to the proper department, it would not be well received; and even if the Superintendents suggest any change, the evils that are described are not perfectly understood by persons whose lives have been always passed at a distance. It is as difficult to make such comprehend the condition of matters among the Indians, as it is to make a foreigner fully understand in a few words the working of our political system. A few men who understand them, it is true, do get into Congress, but all attempts to set matters right, if made, are overpowered by the great majority who do not understand them, and who cannot be made to understand them by the discussion had upon them on the floors of the capitol. The same difficulty is in the way of a proper disposition of the public lands. A Secretary of War, some three or four years since, recommended that the mineral reserves should be sold at a minimum of \$20 per acre; while those acquainted with them well knew that if offered at \$1.25, the great body of them would remain in the hands of the government. This defect of a practical knowledge in those who are called to shape the laws, has been the cause of a ten years' war in Congress, against a permanent pre-emption system, and a graduation of prices. The discussion

upon those matters alone has cost the people hundreds of thousands of dollars, beside a large probable loss of moneys that would have been received into the treasury if they had been adopted ; and at the same time injustice and wrong has been suffered by the settler, and the business of the Land Office uselessly increased by the examination of conflicting claims.

So long as a few traders control the intercourse and monopolize the trade with the Indians, and the laws are shaped so as to favor their designs and interests, the red man must, of course, suffer wrong and injustice, in every shape which avarice can suggest, and cunning devise, for enriching the trader at the expense of his less adroit customer.

We are not of those who clamor against our own government, and slander our own worthy fathers, for an imagined ill-treatment and oppression of the red man, which a morbid sensibility only, not a discerning judgment, may perceive. There is neither fraud nor oppression in purchasing the Indian lands for a full value and more than any neighboring tribe would give him. Neither is he injured by removing him from the society of the white man to those scenes that are congenial to his nature, and where he may freely enjoy those pursuits which he fondly imagines will make the heaven of the good Indian. But, under the laws regulating trade and intercourse with him, the red man suffers injury, not from the government, but from the traders.

It is a matter of some importance, in a state of war between the United States and any foreign nation, that care should be taken to cultivate a good disposition among the Indians on our borders, that our relations with them should be pacific. To ensure this, two things are especially to be regarded, viz.: That our laws controlling our Indian relations be calculated to benefit and give satisfaction

to them ; and that the force of agents be increased. The laws at present existing, governing the trade with the Indians, are void of that wisdom and justice which is necessary to convince the Indian of the kind dispositions of our government. I will refer here to one prominent feature of them. It is that which destroys competition. Monopoly is always odious—odious to the buying class, because, destroying competition, it enables the seller to have his own price for his goods ; and odious and unjust to all other persons, because it violates that first principle in a free government, that the citizen is not to be restricted of his natural rights and liberties farther than is necessary for the good of the whole community. There is nothing in which the violation of this principle is more practically oppressive than in the restraint of trade. Trade is a natural right, in which no man should be restricted but for a great and palpable public good. But in no other direction or department of trade is the principle so thoroughly odious, so oppressive, and so likely to lead to results burdensome to the government, and dangerous to the citizen, as in the Indian trade. The Indian shows not his inferiority to the white man so much in anything as in the arts of trade. Even under the circumstances most favorable to the Indian, he will be generally overreached by the white man. Monopoly places him completely in his power ; free and open competition compels the trader to be more moderate in his exactions, and to relax somewhat of the horse-leech appetite which he is at liberty to indulge when his avarice has full play, and which constantly grows with what it feeds on. There are two plans of obviating the ill effects of this system of monopoly. The first has been suggested : a free and healthy competition. The other is, the establishment of factories by government, and the sale of goods on government account, at regulated prices and moderate profits. This last mode, as a

matter of revenue, is not to be overlooked ; as, with the most moderate profits, it might be made to pay the expenses of our Indian agencies. The impositions of trade are, perhaps, the most felt of all the oppressions to which the Indian is subject. It is one of which advantage can be taken both by the alien enemies of our government, and by citizens who feel aggrieved in being cut off from a lucrative pursuit to which they feel they have a right ; and by means of which the Indian may be stirred up to acts of hostility against our people.

Another evil of the present system is drunkenness. Mr. D. Jones, Indian Agent at Green Bay, says, in his last report to the Commissioner of Indian Affairs :—" I respectfully call your attention to a subject I submitted in my last annual report, and of which I still entertain a favorable opinion. I mean a system of suttlng for the Indians similar to that of the army. If such a system were established, it would not only prevent, in a great measure, the introduction of whiskey among them, besides furnishing all their wants at reasonable prices, but would also do away with the annual collection of large sums of money, taken from the Indians at every payment, by the traders for whiskey. I am satisfied that at least one quarter of the annuity paid to the Menominis is collected by traders, at the annuity payment, for whiskey."

Governor Chambers, in his last report, says :—" I have heretofore taken the liberty, in my annual reports, to express the opinion that our system of trade and intercourse with the Indian tribes is, in this region of country, rapidly destroying them ; and I repeat that they are the victims of fraud and intemperance, superinduced by the large sums of money paid them annually by the government, without proper guards to protect against the superior cunning and avarice of unprincipled white men. The dictates of humanity, apart from considerations of sound policy, demand from the national legisla-

ture an investigation of the abuses practised under the present system, and, as I believe, a radical change of it."

Pontiac has already been mentioned, and the part he took in opposition to the transfer of the dominion of the Illinois country from the French to the English. He was born about the beginning of the eighteenth century, and died a few years after that exchange of masters, about the year 1767, killed, it is said, by a blow from a Kaskaskia. He seems to have been possessed of a great degree of bravery and cruelty, if the deeds of his savage forces and allies were countenanced by him. He is said to have been an Ottawa, though this is not certain. By some he is called a Huron, others say a Sauk. He belonged to some of the tribes about Lake Michigan, but further I have not seen an authentic statement. He appears to have had great influence with all the tribes in the neighborhood of the Lake, Ottawa, Huron, Miami, and others, though his power failed to induce them to take up the tomahawk to resist the English domination. His hatred to the English seems to have been instinctive and invincible. His designs were great, and his energy and boldness sufficient for all occasions. He was not without that very frequent accompaniment of Indian character, treachery. A hundred men possess the qualities, where one acquires the character, of a hero. It is necessary that accident and circumstance concur to bring the qualities to the observation of the world. Pontiac was favored in this respect. The nations of red men in that quarter had not lived in harmony the most perfect. From the Dahcotahs on the west to the Iroquois, east, and from the Hurons on the Lake, to the Ohio, for a long course of years, bloody wars had carried almost extermination to some tribes and nations. A single generation had witnessed the numerous and powerful Illinois nearly swept from the land. This was a school to make a warrior, and

opportunity to bring out the hero. Besides the part they had in this savage warfare, they had joined the French in their successive wars of this period, and had seen the military art in its scientific and formidable shapes, with the aid of tactics and strategy, and its attendants of cannon and all the weapons of civilized war. Pontiac was made of the metal to improve under this teaching, and he accordingly came out of it as good a specimen of the Indian hero, as any other, perhaps, of whom we have knowledge.

Muckatah Mishakiahkiah (the Black Sparrow Hawk), the Sauk chief known in our day, usually called Black Hawk, was in person below the middle size, of that nervous temperament which unites strength with activity, and crowns the union of these faculties with courage and a spirit that seems never exhausted, and cannot be subdued. At the age of fifteen, on an occasion of some outrage committed upon a portion of the Sauks by some Indians of a neighboring tribe, he followed the band of avengers, who pursued and chastised the foe, and entitled himself to the rank of a brave. He was frequently engaged in hostile encounters, and had become the first warrior of the nation. Not liking the treaty of 1830, by which the chiefs of the Sauks had ceded their lands east of the Mississippi, and having other causes of irritation, as already mentioned, he commenced that system of hostility known as the Black Hawk War, the result of which is given in the historical part of this volume. He seems not to have been cruel or treacherous, but to have tempered his courage with generosity and humanity. He had less opportunity than Pontiac to display before the whites his heroism, as he had also not so great a school in which to learn the art of war. He was probably the more amiable man of the two. A strong attachment to their friends was common to both. A high order of intellect belongs to the Sauk tribe, and a man could

not gain much distinction or influence among them without this quality. These two warriors have obtained as much fame as any others whose deeds were done or life passed within the limits of these notes.

I have mentioned the error of the laws regulating trade and intercourse with the Indians. There is a great and radical error in the plan of civilisation. The attempt is made to reduce the roving and free spirit of the child of the forest at once to the drudgery of a systematic, continued industry, to the toil to which man is reconciled in the civilized condition only by his urgent wants, and his restless desires and ambition. But the red man is without the incitements, he feels not the wants, and of course will not assume the burden and labor, of civilized life. Why should he change his whole habit and system of life, and giving up ease and liberty, take to himself toil and slavery? His condition does not require it, and his nature, spirit and habits, all revolt at it. But at the same time that he is invited to this disagreeable change, he is impelled to an acquaintance with artificial wants, by sending clothing, comforts, luxuries and gewgaws to him; and his ambition is raised by these displays, and cherished by reading. It is all precocious and impractical. It is like attempting to make a child walk erect at once, before it has made the primary locomotive process by crawling. Civilisation will not come per saltum. It is a creature that neither will fly nor leap. It is the creature of artificial wants and extra-natural appetites; those again are the creatures of habit, and habit in its turn is generated by circumstances. Through all these conditions man must pass in his progress to civilisation. Instead, therefore, of attempting to bring the red man at once into the unnatural state of civilisation, it should be done by degrees. He should be placed in an intermediate state, where the wants are fewer and the labor

less intense. He should be invited to a pastoral life, rather than to the more toilsome and more intricate and skilful labors of agriculture. Let government, instead of the farming implements and the articles furnished through the traders ; and preceding the schools, give them sheep. It will not be so opposite to their habits ; so above their skill ; or so revolting to their spirit, to tend the flocks. The occupation will give them an article, wool, which will suggest new wants, clothing. They will appropriate it to those wants. Those wants gratified, and a surplus of a valuable commodity left to them, they will create new wants, and will exchange that commodity for something to supply the new want, gratify the new desire. In this way by steps they will acquire both the wants, and the ways and means, of artificial society. But they will neither fall nor jump into them. Some of the tribes have indeed passed very rapidly from the wild state to civilisation ; but a transition state is more natural, more wholesome, and will in the end produce greater results, both numerically and morally.

There is a very singular monument, or collection of monuments, of an unknown race, an unrecorded time, and an unexpressed purpose, existing in this country. These are conical elevations of earthwork standing in the prairies, or sometimes crowned with a grove, of very regular shape, from five to ten feet usually, in height, or sometimes more, and from thirty to fifty or more in diameter, having a circular base. They are usually found in groups or collective ranges, some half dozen or more being placed in line, in contact or close contiguity at the bases, extending usually from east to west. By what people constructed, at what time, or with what design, have been involved in doubt. It seems, however, that their design must have been for receptacles for the dead. These monuments are very frequent, and the

writer has met with them in many places, in a small compass within forty or fifty miles of the Mississippi. Their perfect regularity of shape, size and direction, forbid the idea of a natural formation. It is said the present inhabitants know nothing of them, and have no traditions, and therefore the inference is drawn that they were the works of another race, who had become extinct before the tribes now there possessed the country. To my mind, however, the inference is not a legitimate one. The Indian traditions are of the creation, the deluge, the first appearance of man and woman upon the earth, great eras connected with the formation and peopling of the earth, and kindred to them. But of the extinction of tribes or nations by war and pestilence, and the inhumation of heaps slain by disease or battle, they pass down, I believe, no story. If these were constructed but a few centuries ago, the living descendants of the people who reared them might be now uninformed of their date or object.

Mr. Locke has given an account of some very singular works of this kind in the likeness of quadrupeds, which has been printed in the Appendix to the Report on the geology of the mineral district, by David Dale Owen. Mr. Locke's account is subjoined, as a part of the Appendix to these notes.

APPENDIX.

(A.)

GEOLOGY.

THE country under consideration is of the secondary formation, consisting of the mountain limestone group, and principally, in some parts almost exclusively, of the cliff limestone. It bears marks too distinct to be overlooked, of having been once submerged. The shape and peculiar smoothness of the surface at once gives this idea, which is confirmed on inspection, by finding among the superior strata near the surface, stone composed wholly of fossil marine shells. The uniform slope of the land, also, is another evidence of the same fact. This feature has been mentioned in describing the physical geography. It is about as regular from the Gulf to St. Peter's, as the bed of the sea upon one of our sand beaches, and in the whole distance of more than 1000 miles, does not much exceed a rise of 1000 feet, or one foot to a mile. At the sources of the Mississippi and St. Peter's, we reach the height of land between the Gulf and Hudson's Bay, the waters of Red River, which run into the last, starting almost in contact with the two others. Indeed the passage can be made in boats at seasons of high water, from St. Peter's to Red River. It may be therefore regarded as a certain fact,

that formerly the sea covered this whole valley, from the Gulf to Hudson's Bay, dividing North America into two continents, of one of which the Alleghany, of the other the Rocky mountain range formed the nuclei. This would seem to be at a very remote period, as there are indications that it has been inhabited at an antediluvian period. Pieces of pottery have been found in different places, more than fifty feet below the surface, in digging wells: and this position can hardly be accounted for, without supposing a great disturbance of the upper strata of the earth, and also a considerable lapse of time. There is a very abundant deposit of coal in several portions of the valley: beside the large Illinois coal field: generally regarded as evidence of an antediluvian vegetation. According to Mr. Guion, there are large beds of coal on the Des Moines. The erratic deposits are found upon the surface upon very distant points in this region. They are mentioned by Nicollet upon the Tchan-sansan and Tchankasndata, as well as high upon the St. Peter's, and the author has observed them upon the Wabesipinicon. Mr. Schoolcraft says the rock on the southern shore of Lake Superior consists of granite, slate, and sandstone.

The country bordering on the Mississippi, within the inhabited portions of Iowa, and below, is chiefly a mountain limestone. In some localities, as already mentioned, are strata of fossil cretaceous formation, composed mostly or wholly of shell. At the top of the bluff at Burlington, at about 150 or 200 feet above the mark of high water at the usual stage of the river, covered only with a thin layer of chert and vegetable mould of a few inches, is an encrinitic limestone which may, from appearance, be altogether of this shell. And, at Iowa City, the same shell composes a very soft, fine-grained marble of a dingy-white color, which re-

ceives a fine polish, and is a highly ornamental and valuable stone. There is also a soft, black, variegated marble, like the Egyptian, and some other marbles in the southern portion of Iowa, between the Des Moines and Iowa. In some parts of this district bituminous coal has been found, and on the east side of the Mississippi is an extensive bed. Further north, about the Wabesipinicon, is a region of iron, then the great bed of galena or sulphate of lead, and in the farther north the copper district. This is probably the richest mineral region in the world ; and to the geologist and mineralogist, an extensive and profitable field of research. The banks of the Mississippi contain great quantities of the precious stones, which are washed out by rains and carried down by the stream. In some places, within four or five years, the writer has found some very beautiful agates and cornelians in the streets of the towns ; and, in a stroll of an hour on the shore, has loaded his pockets with them.

There are several very accurate and complete descriptions of the geology of this country. And, instead of attempting to give my own account of it, I shall embody in this part of my work the published account of Long, Owen, and Nicollet, &c., which, together, include the greater part of the country which is the subject of this volume. My own observation of the country, geologically, being very cursory and partial, and the survey of these gentlemen, all scientific men, furnishing a very satisfactory description of the country in this respect : I transcribe their observations in extenso. Mr. Nicollet's observations extended over a large portion of this region, and his remarks below give us the result in several different localities. He says :

“ The region comprised within my map is covered by a species of deposit of the kind for a long time known by the name of diluvium ; but, as this word implies a theoretic idea

as regards the accumulation of such deposits, the cause of which is still open to controversy, it is now very generally abandoned, and the designation of erratic deposits, among others, adopted in its stead. I have, therefore, used the latter expression, as comprehending a vast deposit of sand, gravel, pebbles, clay (arranged in zones, and occupying almost always the bottoms), and masses of rocks transported to a distance from their original position, usually called erratic blocks. This deposit always occurs between the vegetable soil and the rocky strata of all ages that constitute the geological basis of each section of country. To the north and to the south of the western portion of Lake Superior, as far as the upper half of St. Peter's River, it overlies primary rocks; south of the St. Peter's, to the west and east of the Mississippi, it covers silurian rocks; whilst, on the Upper Missouri, it rests upon a cretaceous formation, everywhere mixing itself with the detritus of the rocks in place. The thickness of this deposit is very variable; sometimes only quite superficial, and, when of a more important character, from 150 to 160 feet in depth. It is met with, indifferently, with its erratic fragments, on the summits of hills, on the upland plateaux, over the plains, and in the valleys. It has contributed towards levelling the original irregularities of the soil, by filling up hollows; or varied them, by transporting over the country new materials; whilst the subsequent action of water and weather has further brought about its characteristic features.

“The erratic blocks of this deposit are not generally rounded, but they are still boulders. Those which have the rounded appearance, most usual to boulders, among a great many that I had an opportunity of examining, owe it to their exposure to the atmospheric agents which have worn them down. This is made evident by examining those portions of

them which are buried in the soil, and, in this way, protected; their angles and corners show but little erosion. On the other hand, wherever there is a deposit of pebbles, its origin may be easily traced to local causes that have acted long after the arrival of the erratic deposit now under consideration.

“It is difficult to determine the direction whence the materials of the erratic deposit came. The presumption is, judging from the nature of the erratic blocks—the analogues of which are found in higher latitudes—that they were brought from the north to the south.

“On the borders of the great lakes, on the flanks of valleys, and where traces of recent floods are apparent, the erratic blocks are in great abundance. Their size varies from a few inches to a few cubic feet; yet this seems to bear no relation to the distance whence they are supposed to have come. On the contrary, it appears that the largest are often found in the highest spots, and at a greater distance from their origin. I did not find them more abundant on the northern slopes of hills than on the southern. Their oryctognostic distinctions are—granitic sienite, resembling the Egyptian red granite; a true sienite, with white feldspar; a granite, with a large proportion of feldspar; gneiss, amphibolite, red jasper, quartz pebbles, and a great variety of agates and cornelians. These last are carried off by the streams, and scattered in great numbers over the shores of the Mississippi and Missouri; but they have no value, and are collected by travellers merely as reminiscences. The sand and gravel are composed of the small fragments of all these rocks; the sand, though varying according to places, being principally siliceous. It is this sand which constitutes the predominant ingredient in the soils of the whole region embraced in the map, modified according

to localities by the presence of carbonate of lime, magnesia, oxide of iron, &c.

“The uplands that border on the rapids are based upon the mountain or carboniferous limestone, as the contained fossils indicate. The limestone, of a dirty color, and much broken up, is the matrix of numerous siliceous and calcareous geodes. These fine geodes, picked up by all travellers, are found on the banks of the rapids, having fallen from the adjoining bluffs. Within a few years, there has been a road opened leading to Warsaw, and, being cut off from the bluff, has exposed to view the stratum in which the geodes occur, and their position therein. They are observed to be slightly compressed, their greater axes being parallel to the stratification of the limestone, which is horizontal. As I have collected a number of them, I shall describe, mineralogically, a few of those that have appeared to me the most interesting in their mineral association, viz.:—

1. Siliceous geodes, the cavity of which is filled with prismatic crystals of limpid quartz (quarz hyalin).
2. Siliceous geodes, filled with crystalline quartz, the pyramidal terminations of which are of a red color.
3. Siliceous geodes, filled with crystallized calcareous spar (variety, *en tête de clou* of Haüy).
4. Silico-calcareous geodes, with rhombic calcareous spar.
5. Silico-calcareous geodes, with confusedly crystallized calcareous spar.
6. Siliceous geodes, enclosing calcareous spar and crystalline sulphuret of zinc.
7. Siliceous geodes, containing mamelonated chalcedony, of a red color.

“These geodes vary in size from four or five inches in diameter to twelve or fifteen.

“The following section exhibits the several subdivi-

sions according to mineralogical and oryctognostical distinctions of character at Burlington, and in the descending order :—

1. Superficial soil	-	-	-	25 feet.
2. Chert	-	-	-	2 "
3. Yellow limestone, with spatic encrinites and productæ	-	-	-	10 "
4. Calcareous argillaceous marl, with few fossils				3 "
5. Siliceous limestone	-	-	-	2 "
6. Oolitic limestone, with productæ	-	-	-	2 "
7. Bluish clay	-	-	-	3 "
8. Yellow compact limestone	-	-	-	3 "
9. Compact siliceous limestone, with veins of calcareous spar	-	-	-	8 "
10. Oolitic limestone	-	-	-	$\frac{1}{2}$ "
11. Saccharoidal blue limestone, with veins of calcareous spar, and impressions of small orthids and strophomena	-	-	-	$\frac{1}{2}$ "

"The valley of the 'Red Pipestone' extends from N.NW. to S.SE., in the form of an ellipsis; being about three miles in length, with a breadth, at its smaller axis, of half a mile. It is cradle-shaped, and its slope to the east is a smooth sward, without trees and without rocks. Its slope to the west is rugged, presenting a surface of rocks throughout its whole length, that form a very picturesque appearance, and would deserve a special description if this were the place to do so. But I am now more particularly interested in defining its geological features.

"The principal rock that strikes the attention of the observer in this remarkable inland bluff is an indurated [metamorphic] sand-rock, or quartzite, the red color of which diminishes in intensity from the base to the summit. It is

distinctly stratified ; the upper beds being very much weather-worn and disintegrated into large and small cubic fragments.

“ The whole thickness of this quartzite, which immediately overlies the bed of the red pipestone, is twenty-six and a half feet. Its strata appear to have a small dip to the NE. The floor of the valley, which is higher than the red pipestone, is formed by the inferior strata of the quartzite, and, in the spring of the year, is most generally under water ; the action of which upon the rock is apparent in the great quantity of fragments strewn over the valley, so as to render it uncomfortable to walk over them. The creek, by which the valley is drained, feeds, in its course, three distinct small basins, at different elevations, that penetrate down as far as the red pipestone.

“ This red pipestone, not more interesting to the Indian than it is to the man of science, by its unique character, deserves a particular description. In the quarry of it which I had opened, the thickness of the bed is one foot and a half, the upper portion of which separates in thin slabs, whilst the lower ones are more compact. As a mineralogical species, it may be described as follows : compact ; structure, slaty ; receiving a dull polish ; having a red streak ; color, blood red, with dots of a fainter shade of the same color ; fracture, rough ; sectile, feel somewhat greasy ; hardness not yielding to the nail ; not scratched by selenite, but easily by calcareous spar ; specific gravity, 2.90. The acids have no action upon it ; before the blow-pipe it is infusible *per se*, but, with borax, gives a green glass.

“ According to Professor Jackson, of Boston, who has analysed it, and applied to it the name of catlinite, after Mr. Catlin, it is composed of

Water	-	-	-	-	-	8.4
Silica	-	-	-	-	-	48.2
Alumina	-	-	-	-	-	28.2
Magnesia	-	-	-	-	-	6.0
Peroxide of iron	-	-	-	-	-	5.0
Oxide of manganese	-	-	-	-	-	0.6
Carbonate of lime	-	-	-	-	-	2.6
Loss (probably magnesia)	-	-	-	-	-	1.0

 100

"But Professor Jackson assimilates it to the agalmatolite, from which it differs, however, very materially by its general aspect, its conduct before the blow-pipe, and its total insolubility in sulphuric acid.

"Another feature of the Red Pipestone Valley, is the occurrence of granitic boulders of larger size than any I had previously met. One of them measured about 60 feet in circumference, and was from 10 to 12 feet thick. They are strewn over the valley, in which it is remarkable that there are no pebbles.

"On the left bank of the Mankato, six miles from its mouth, in a rocky bluff composed of sandstone and limestone, are found cavities in which the famed blue or green earth, used by the Sioux as their principal pigment, is obtained.

"As I did in the case of the red pipestone described above, I will state the mineralogical characters of the Indian blue earth, or clay. It is massive, somewhat plastic, emits an argillaceous odor when breathed upon;—color, bluish green; easily scratched with the nail when formed into hardened balls. The acids have no action upon it; it is infusible before the blow-pipe, but loses its color and becomes brown. This color is due to the peroxide of iron, which it

contains in the proportion of ten per cent. at least. It contains no potash, and but a small proportion of lime. It is a very different mineral from that described by Dr. Thompson, under the name of pipe-clay.

“ The predominant rock in this region of country to which I am now referring—namely, from the Platte River to Council Bluffs—is the carboniferous or mountain limestone, well characterized by the fossils, consisting principally of the *producta lobata*, *producta punctata*, *orthis*, *delthyris*, *turbinolia fungites*, *crinoidal remains*, &c. ; most of these genera affording several new species as yet undescribed.

“ This formation is a continuation of that which underlies so vast an extent of the Mississippi Valley ; but having a much larger development over the States that are to the east of this river, and extending even to the Alleghanies. It is the support of important coal-basins, and rests upon a group of silurian rocks, beginning at the Falls of St. Anthony, extending itself from north to south, constituting the mineral regions of Iowa, Wisconsin, and Missouri, and losing itself somewhere in the State of Arkansas. This last-mentioned group is bounded at the north by amphibolic rocks, steaschists, and clay slates, that extend to beyond 47° of N. latitude ; and at the south also by steaschists and clay slates, that compose the principal rocks at Little Rock in the State of Arkansas, and also those of the Washita mountains. These rocks are referrible to certain members of the group to which Mr. D’Homaluis d’Halloy has given the name of *terrain ardoisier*, and have their equivalent in the series of the *grauwacke* of German geologists. Thus, by this distribution of the geological formations, it would seem that, more particularly to the west of the Mississippi, the silurian group is imbedded within the ‘*terrain ardoisier*,’ or *grauwacke*,

just as the carboniferous series, with its coal measures, overlies the silurian.

“From what I have so far said of the geology of the West, it will be perceived that I have adopted the classification of the older fossiliferous rocks, as laid down by its illustrious author, Mr. Murchison. But I must confess that I hesitated about it a long time; notwithstanding the opinions of my friends MM. Vanuxem and Conrad, both distinguished geologists and conchologists, who had recognized among my fossils irrecusable evidences of the occurrence of a silurian group in the West. Having attached too much importance to the term ‘old red sandstone;’ seeking, in vain, over the country that I was exploring, an equivalent for it, either mineralogical or palæontological, which would enable me to separate the carboniferous from the silurian system, unless I chose to find it in the sandstone on the St. Louis of Lake Superior, or that of the environs of Little Rock, in the Arkansas; and not feeling authorized to do so, from the absence of fossils—fearing, moreover, that these rocks were actually beyond the limits of the system under consideration, as I said before, I could not but hesitate. However, having recently become acquainted with the learned papers read in 1840 before the Geological Society of France, by MM. Murchison and De Verneuil—one ‘on the Devonian rocks of the Boulonnais;’ the other ‘on the importance of determining the limits between the mountain limestone and the inferior formations’—a new light was afforded me; all my doubts were dissipated; and I then saw the necessity, in identifying the relative ages of rocks, and especially those separated from each other by long intervals of country, to attend exclusively to their fossil contents.

“Starting, then, from this principle, I think I can confi-

dently offer indubitable proofs of the occurrence of the Devonian rocks on the Missouri River.

"In latitude $40^{\circ} 50'$, and longitude $95^{\circ} 42'$ from Greenwich, eighteen miles below Platte River, there is a locality known by the name of 'Five Barrels Island.' Opposite to that group, and on the right side of the river, a bluff, at the termination of a series of rocky banks, is separated by a small creek from another series called *Côtes de la Platte*. At the base of the bluff there is—

"1st. A compact argillaceous limestone of a bluish color, from one to two feet thick ; soft under water, but hardening when exposed to the air ; it weathers into thin plates, presenting an uneven surface ; on which there are impressions of *euomphali*, but too indistinct to be specified.

"2d. A compact argillaceous limestone of a yellowish-grey color, from six to seven feet thick, containing an abundance of crinoidal remains, associated with beautiful and large specimens of the *cyathophyllum vermiculare* of Gold. This limestone also contains a *producta* and an unknown bivalve, together with crystallized bi-sulphuret of iron agglomerated into bullets.

"The uppermost portion of the bluffs, attaining a height of 180 feet above the river, I remarked to be shadowed by trees over a beautiful green sward ; but I had no opportunity of examining it particularly.

"It may be well to state here, that all such rocky banks as the one just alluded to, noticed by Lewis and Clark, and subsequently by Major Long, are constantly wearing away ; so that they offer landmarks to the traveller only for a limited period of time. But we are not to judge of their oryctognostical character from the detritus found below them ; because this is composed not only of the materials derived from the bluffs, but of others carried down the Missouri

during its season of high waters. Among these materials is the oft-mentioned pumice stone, which is brought down from the upper parts of the river. I have ascertained, by a more careful examination than had probably been given to it previously, that it is not a true pumice, but a semivitreous substance, produced by pseudo-volcanoes, that I shall hereafter describe; the region of which is laid down upon my map.

“On the elevated prairies above the bluffs, the ‘erratic deposit’ again appears; amongst which I found, for the first time, fragments of quartzite in every respect similar to that of the Red Pipestone Quarry.

“Mr. Murchison, in his lately published Memoir, refers to a paper by Mr. Lonsdale on the Devonian system, in which that celebrated palæontologist indicates the principal fossils belonging to it; referring, also, to the species found in Belgium and in France, as well as in Devonshire. In this list of six species enumerated as belonging characteristically to the Devonian system, I find *stromboles vermicularis*, or *cyathophyllum vermiculare*; and *euomphalus radiatus* (Gold). The *cyathophyllum vermiculare*, it appears, is the only species that is found both in the Devonshire rocks and those of the Boulonnais. Well, now, if we take into account the enormous distance that separates the small group that I have just described, with its equivalent in France and in England, will it be thought hazarding too much to detach it from the place I had first assigned to it in the lower mountain limestone, and bring it down to the Devonian system?

“The group to which I am now referring, and which is at the base of the rocky banks previously described, is very fossiliferous, and has a great extent; though I had no occasion to give it but a rapid examination. I may be permitted to hope that naturalists more fortunately circumstanced will discover among it other characteristics by which to complete

an identification with its European equivalents ; thereby stamping upon the new classification of the older fossiliferous rocks an additional proof of contemporaneity as regards the 'Far West' of America, which will most probably be verified in time over our whole globe.

"This series of rocks, then (which I feel necessitated to refer to the Devonian system, for reasons stated above), underlying those of the carboniferous system, have, consequently, their appropriate place above the silurian rocks, members of which are found beyond Wolf river, and, again, now and then, in proceeding from bluff to bluff along the Missouri.

"The carboniferous rocks, which form a large and important feature in the geology of this region, are full of fossils, and may be said to offer a new field of exploration to the fossil conchologist in the great number of new species belonging to the genera *producta*—*delthyris*, *orthis*, *strophomena*, *atrypa*, *favorites*, &c. To indicate the numerous localities where these fossils are variously associated with each other, would only be multiplying a list of them—which I cannot afford to do in a report, the scale of which hardly leaves room to lay down the greatest geological divisions of the country. I would only add, that the *producta lobata*, and *producta punctata*, and the *turbinolia fungites* of Phillips, appear to me to be the characteristic fossils of the carboniferous rocks in this region. They occur at localities very distant from each other—between Five Barrels Island and Council Bluffs ; on the Des Moines ; from Racoon Fork to the lower rapids of the Mississippi ; in the vicinity of St. Louis, St. Genevieve, &c., &c. At the last-mentioned locality, on the limestone over which the creek called Gaboury flows, the *turbinolia fungites* and a new species of *producta* are found associated with the *bellerophon hiulcus*,

as well as other species ; and they are all mineralized into red chalcedony.

“ The upper strata of this Gabouri limestone present a beautiful rock with an oolitic structure, which is now quarried for architectural purposes. It is doubtless an equivalent of that which occurs in the Burlington group, Iowa. It extends itself to the right and to the left of the Mississippi, to near the Ohio river, and even through Kentucky and Tennessee. The fossils contained in the oolitic limestone of the Gabouri are obscure and undeterminable ; but, in other localities, this rock has yielded *pentremites pyriformis*, *pentremites globosus*, *pentremites florealis*, that have been described by Say, and a fourth species, which is new.

“ I have deemed the foregoing digression necessary in order to connect the geology of the country just described, with a more recent formation, previously alluded to, with which I am to meet in ascending the Missouri.

“ I landed a mile or so before reaching the mouth of the Sioux River, on the left bank of the Missouri, to examine a rocky bank, seemingly a continuation of those apparent at Wood's Hill. I found it to consist of—

“ 1st. A carboniferous limestone ;

“ 2d. An argillaceous schistose limestone.

“ The rocks in this locality reach only to an elevation of seven or eight feet above the level of the river ; and I take notice of them here, because I am disposed to think that they are the last representatives of the carboniferous series in the ascent of the Missouri, and that the mouth of the Sioux River is the true limit in this direction of the old fossiliferous rocks.

“ The rocks of which it (Dixon's Bluff) is composed, are the same that constantly make their appearance on ascending the river, at the base of the hills which bound the valley. I

shall content myself with describing them once for all. Moreover, to facilitate the reference which it may be necessary to make to the different geological divisions of a group of rocks which I propose to consider under the name of Dixon's Group, or Dixon's Bluff, I shall note the divisions of this group, in their ascending order, by the letters of the alphabet, viz.:—

“ A. Argillaceous limestone, containing *inoceramus barabini*, in great number and very much compressed, and so arranged as to give the rock a slaty structure. This stratum sinks below the bed of the river, and, consequently, its thickness is indeterminable; that part of it above the water on the day of my examination was three feet. Starting from this place, and ascending the river, this rock must necessarily disappear below the level of the water. It is, probably, more conspicuous in the two preceding cliffs I have referred to before, but which I had not an opportunity of examining. The upper portions of the rock, that I did examine, contain nodules of iron pyrites, being an assemblage of small cubic, cubo-octædral, and octædral crystals.

“ B. A calcareous marl, generally from thirty to forty feet thick, but, at this spot, reduced, by a slide, to fifteen or twenty feet. Its colors are grey, greyish-blue, and sometimes yellow. It contains but very few fossils. I found, myself, but one orbicula, and what appears to be a fish-scale.

“ C. This is a slightly ferruginous clay-bank, of a yellowish color, with seams of selenite, and affording, occasionally, rounded masses, somewhat resembling *septariæ*. The selenite is in acicular crystals, or in its more usual form of rhombic prisms, variously truncated.

Such are the three divisions that I have thought necessary to make in this group of rocks, and which are always thus associated as the river is ascended. This group is the basis

of the cretaceous formation of the Missouri. The upper sub-divisions, which I shall have occasion to establish further up, and that are not sufficiently distinct here, will complete an account of this interesting formation.

“On quitting Huppan-kutey Prairie, the entrance to the Wassisha, or Vermilion River, and that of the Rivière Jacques of the French, the Tchan-sansan of the Sioux, are passed by in succession. In this interval, the valley hills are at a distance, and the cretaceous formation is not easily followed up; but, a little further on, it re-appears on the left side, with the plateau dividing the waters that empty into the Tchan-sansan from those that flow into the Missouri. This upland is known as the ‘Coteau des Prairies du Missouri,’ or, more shortly, ‘Coteau du Missouri.’

“The elevated prairies that crown the right bank of the Missouri River, rise gradually in the direction of the Rocky Mountains, forming the northern extremity of those steppes, more appropriately designated the American Desert. Hence, it will be perceived that the river has its bed deeply incased in a valley, flanked on the left side by the Coteau du Missouri, and on the right by the American Desert. Over a length of 235 miles, comprised within this valley, between the Ni-obrarah, or ‘Eau-qui-court’ river, and Fort Pierre Chouteau, the cretaceous formation exhibits its fullest development. It may be satisfactorily examined at many places within this range; but a perfect representation of the whole of them may be obtained, if, taking as a basis the description previously given of Dixon’s Bluff, there be added to it the modification presented by some of its new members.

“I may be permitted to think that this cretaceous formation is destined to occupy a conspicuous place in the history of American geology; and, as I am not aware that any details concerning it are recorded, I shall now, to the exclusion of

other matters, possibly of equal interest, say all that I know about it.

"It is necessary, then, in the first place, to take both a geographical and geological horizon. Thus, referring to the map: starting, for instance, from the Wicha-pahah, or Scalp Mountain Creek, in lat. $43^{\circ} 8'$, and visiting, successively, as follows—the hills at the mouth of Whetstone Creek; those in the vicinity of Red Cedar, Snags, and Sailor's Islands; the Mankizitah, or White-earth River; the American River, the Great Bend (which is the Karmichigah of the Sioux), it will be easy to understand all the circumstances about which I shall now give an account.

"1st. The stratum of argillaceous limestone, observed at Dixon's Bluff, has disappeared, in consequence of the elevation of the level of the valley.

"2d. The calcareous marl, in horizontal stratification, continues to make its appearance in escarpments, of from thirty to forty feet, containing the same fossils—namely, orbicula and fish-scales.

"Over this bed, or rather between it and the preceding one, there seems to be occasionally found a thin layer of fibrous carbonate of lime, the true position of which I was a long time in determining, as I had discovered fragments of it only among the rubbish at the foot of the bluff. I have since observed it in place above the calcareous marl; and it is interesting that it is covered with coats of a fossil, very much resembling the gryphœa Vomer, but which Mr. Conrad has described under the name of ostrea congesta.

"3d. The bed C, composed of a foliated and selenituous clay, acquires interest, as it develops itself in other localities. Its thickness is variable. I have found it twenty feet thick; and its strata are divided by thin layers of a more indurated white clay. In these several stages, the seleniferous clay,

of a yellowish color at the bottom, becomes black and more foliated in its superior beds. The selenite is more abundant, replacing, as it were, the white indurated clay.

"The specimens of selenite obtained from this division of the Dixon group are worthy of notice, in consequence of the peculiar forms that they assume—some of them presenting the appearance of leaves of trees, beautifully and gracefully scalloped; which has encouraged me to venture upon a descriptive name, as a mineralogical variety, by which to designate them. I call them phylloidal selenite. Others are in the usual shape of six-sided regular prisms, 'en fer de lance,' lanciform, radiating, &c.

"4th. The rock designated as D is the last member of the trans-Mississippian cretaceous formation, as it presents itself on the Missouri River. It is a vast deposit of plastic clay, about two hundred feet thick, which may be considered, however, divided into two equal parts by a stratum of argillaceous carbonate of lime in nodules, of which I had no occasion to ascertain the thickness. Many of these nodules, having fallen from their original position, are met with in considerable quantities in the beds of the ravines, and in other places. Associated with it is a ferruginous sandstone, which presents itself in flat polygons, on the surface of which there are seen numerous concentric lines of great regularity, so as to imitate the transverse sections of a tree. The same deposit contains, disseminated through it, lumps of the yellowish clay of the inferior stratum, C, and enclosing leaves of selenite, and cavities lined with concretionary gypsum. But these lumps are more frequent in the lower half of the deposit than in the upper, and finally cease altogether to appear.

"There are also found, throughout the clay deposit, loose

pieces of limestone, the origin of which I will not attempt to assign precisely, though they may have belonged to subordinate beds of this rock, that exist somewhere in this formation. I have collected some myself; others were brought to me by my men; and, as a notification to future geologists who may travel over this region, I signalize them by their mineralogical characters.

“ 1. A cylindrical limestone, resembling arragonite.

“ 2. Limestone of loose texture, yellow, crossed by small and numerous veins of calcareous spar.

“ 3. Limestone of a greyish color, with veins of calcareous spar, and invested occasionally by dog-tooth spar. [C. carb. metastastique of Haüy.]

“ 4. Greyish limestone, with veins of calcareous spar.

“The inferior members of the group that I have just described contain, it is true, but rare and indistinct organic remains. But no richer field could be offered to the fossil conchologist than that presented by the upper portions of the plastic clay—by the variety, the abundance, and the beauty of the specimens, being nearly all new species of ammonites, baculites, belemnites, hipponyx, cytherea, tellina, inoceramus, &c. The species, however, which, from its abundance, and the different signs under which it is found, would seem to me to characterize the whole formation, is the inoceramus barabini of Morton.

“This cretaceous formation may be considered, I believe, as fairly exhibiting the characteristic features in the geology of the Missouri, over an extent of country more than 400 miles in length by water, starting from the mouth of the Sioux River, which latter river is 795 miles from the confluence of the former with the Mississippi, to the approach of the Shayan, which I have laid down on my map as the Washtey, or Good River of the Sioux. It will be readily conceived

that, as the level of the valley of the Missouri gradually rises, there is a corresponding depression in that of the formation. But what remains of it at the spot where I left it, conjoined to information gathered, leads me to suppose that other traces of it will be found, perhaps, not far from the Yellow Stone River; so that its whole extent along the Missouri, in a generally NW. course, would be no less than 1,000 miles. As to its western limits, without pretending to define these positively, I may state that I have in my possession interesting fragments of ammonite placenta and baculite ovatus, brought to me from the clay-banks of the upper part of Shayan and White Rivers. It is, therefore, probable that the extent of the formation, due W., is not less than 250 miles by water, along which it is, probably, open to examination.

“The plateau of the Coteau des Prairies is composed, in a great measure, of the materials belonging to what I have named the erratic deposit, as is evidenced by the nature of its soil, the physiognomy of the ridges and hillocks that diversify its surface, the deep ravines by which it is flanked, and the innumerable erratic blocks strewed over the borders of its lakes.

“We have no data by which to determine the inferior limits of this deposit; still, there is reason to think it rests upon such primary rocks as show themselves along the line of rapids of the Upper St. Peter's, consisting of granite, sienitic, and other metamorphic rocks. Nevertheless, over the vast extent of this plateau, there is, apparently, but one spot where the subjacent rock makes its appearance—and this is at the Indian Red Pipestone Quarry, so called.

“The Falls of St. Anthony form the limits of the calcareous deposit that characterizes the shores of the Mississippi from the mouth of the Wisconsin. The rocky formations then assume another type, being the several varieties

of green stone, and finally passing into talcose slate, which is visible at the falls of the Wabezi, or Swan River, and the Omoshkos, or Elk River, near their entrances.

“The most prominent geological feature of the country, on the eastern side of the river, a little below the Pikwabik, is a large mass in situ of a sienitic rock, with flesh-colored felspar, extending a mile in length, with a breadth of half a mile, and an elevation of eighty feet, known as the Little Rock. Higher up, and still on the same side of the river, at the foot of the Knife Rapids, there are sources that transport a very fine, brilliant, and bluish sand, accompanied by a soft and unctuous matter. This appears to be the result of a decomposition of a steaschist, probably interposed between the sienitic rocks previously mentioned. The same thing is observed at the mouths of Wabezi and Omoshkos Rivers.

“The geological features of the country, in the ascent of the Mississippi, from the St. Peter's to the Falls of St. Anthony, are as follows :

“1. Fine grained, unstratified sandstone, constituting the base of the bluff, and ranging in thickness between sixty and eighty feet, of a very friable character ; each grain being a crystalline fragment of quartz. In some parts of the mass the grains are stained with oxide of iron ; while in others they are perfectly white. It is probable that the sand furnished by the latter would serve in the manufacture of glass.

“2. A compact sublamellar limestone of variable colors, as fawn, yellowish-buff, or greyish. It contains many fossils, but very irregularly distributed in the mass ; some being covered with brilliant crystals of carbonate of lime, and others entirely mineralized. This bed is from eight to twelve feet thick, weathering into layers of from two inches to a foot thick. The limestone under consideration resembles

much, in mineralogical characters, that which has been named cliff limestone by Dr. Locke in his Report on the Geology of the State of Ohio, and which has been more recently again described by Dr. Owen in his Report on the Mineral Region of Illinois and of Iowa. Should the two rocks be identical, No. 2 of the preceding section would then be the equivalent of the Western blue limestone of these geologists ; with the difference, that the two rocks are here less developed than in the other localities observed by them.

“ 3. Soil, consisting of sand, gravel, and clay, mixed with the disintegration of the limestone in place, and amidst which there are erratic blocks scattered over the plains and on the slopes on the hills, and which are traced to the summits of the Pilot Knob.

“ As it is important, in geology, to determine the precise limits of formations, I shall add a few words on this subject. The geological formation of St. Peter's continues to show itself in the river of the same name, and goes on thinning out as far as Waraju River (the *rivière aux Liards* of the French), and there it disappears. Hence it passes to the head-waters of Mankato River, crosses the southern part of the Coteau des Prairies, and finally loses itself in the Missouri, Sioux, and Iowa Rivers, as previously explained when describing the extent of the cretaceous formation.”

Mr. Keating, the geologist of Long's second expedition, gives the following description of a portion of country east of the river :—

“ On the banks of this stream” (the Wassemon, one of the upper branches of the Pectanon, as called by Long, or Pecktonica, as called by the Indians) “ we observed the limestone in place, forming cliffs of about fifty feet in height. The rock is in very distinct horizontal stratification ; its structure is in many parts crystalline, or perhaps it may

more properly be called gravelly and sandy. It contains many cells or cavities, some of which are filled with crystallizations of carbonate of lime: much white hornstone appears disseminated throughout the mass. The hornstone is sometimes seen to constitute small beds or layers from one to three or four inches in thickness, which are continued for several feet in length; frequently also appearing under the form of flattened irregular nodules lying in an almost continuous line for a considerable distance, and with their long or flattened side parallel to the stratification; resembling in this respect the disposition of the clay-iron stone in the slaty strata that accompany the bituminous coal. Organic remains are by no means uncommon, though they are not found as abundantly as in some other spots of our route. They consist of terebratulites, encrinites, and a madreporite (Linné); the true nature of the last of these could not be ascertained without a comparison of characters, which we were unable to make on the spot, and which the loss of all the specimens collected between Fort Wayne and Fort St. Anthony, has prevented Mr. Say from making since; the rock is of a greyish yellow color, with a loose structure. We are aware that some of the characters which we have given of this rock might lead to the opinion that it resembles the mountain or carboniferous limestone of Messrs. Conybeare and Phillips; and consequently that it is the same as the metalliferous limestone of other geologists; but we would consider this opinion as a very hasty, not to say, an incorrect one. Although its cavernous nature, its indication of crystallization, and its organic remains, present an apparent correspondence with those of that limestone as described by the Rev. W. D. Conybeare in the excellent 'Outlines of the Geology of England and Wales' (part i., p. 353), we incline to the opinion that this rock is of a much later formation; we believe it to

be connected with a limestone which was subsequently observed in the Mississippi, between Prairie Du Chien and St. Anthony, and in which we observed an oolite and a pulverulent limestone similar to the calcareous ashes described by Mr. Freisleben in his elaborate account of the formations of Thuringen. If we compare the characters of this rock with those of the limestone observed by Mr. Freisleben, and described by him under the name of zechstein and rauchwacké, we will be surprised at the great similarity in their appearance. The zechstein is a compact, hard and tough limestone of an ash-grey color, passing into blackish-grey, distinctly stratified, without however presenting any slaty appearance, or, at least, much less so than the inferior beds. It contains specks and some veins of calcareous spar and gypsum; also crystals of quartz, &c.: it likewise offers sometimes specks of galena. It generally presents but few petrifications. Corallites and millepores, as well as several species of terebratulites, ammonites, &c., have been found in it.

“ Above this compact limestone another stratum of calcareous rock is found, which is known in the country under the name of rauchwacké (smoky wacké). It is a limestone probably intermixed with silex, of a dark grey, sometimes blackish color, with a somewhat scaly fracture, occasionally fine-grained, sometimes, though seldom, oolitic, hard, tough, and filled with pores or cavities: this last feature is characteristic. It may be observed even in those parts of the stratum which appear most compact. The cavities are angular, long and narrow (as in a cracked clay). The interior of the cavities is lined with small crystals of calc-spar. These cavities are sometimes large, being several yards in length and breadth. He afterwards proceeds to describe the ashes or pulverulent substance found near it. This, from its

great similarity to the residue of the combustion of wood, is designated in Germany by the name of asche (ashes). These characters, when taken into connection, appear to us to correspond so well with those observed on the Wassemon, on the Mississippi, and throughout the country between Rock River and Prairie Du Chien, that we feel strongly induced to consider the limestone of this country as analogous to that observed by Mr. Freisleben. This limestone is, by some European continental geologists, referred to the Lias of English geologists; but we would rather refer it, with Messrs. Conybeare and Phillips, to the newer magnesian or conglomerate limestone of England. To this we think it has the strongest analogy. It is probably connected, as we have already intimated, with the limestone situated above the coal fields of Wheeling and Zanesville. It extends over those parts of Ohio and Indiana where salt has been found. It is observed cellular, cavernous, &c., on the banks of the Wassemon. It is connected with real calcareous ashes on the Mississippi. The presence of the oolite which was observed here in a single spot, does not militate against the position which we have taken, as we find it stated by Conybeare and Phillips (page 302) on the authority of Mr. Wynch, that the magnesian limestone is occasionally oolitic. It presents, in many of its points, the characters of the rauchwacke, and especially the cellular or cavernous structure. It is seldom found very abundantly strewed with organic remains. Its color is the pale buff, passing to the ash-grey. In fine, the more attentively we examine it, the more closely do we find it to connect itself with the formations of Thuringen, and with those which cover so extensive a part of England, and more particularly with that observed in Yorkshire by Professor Buckland; offering thus, as it appears to us, a beautiful confirmation of the analogy established between

the various kinds of this limestone observed in divers parts of Europe. There is an experiment which would, as we conceive, place the matter beyond a doubt: this would be an analysis of the limestone, with a view to ascertain the quantity of magnesia which it contains, and we regret much that the loss of our specimens has deprived us of the opportunity of this analysis. But we think the case sufficiently strong to justify us in considering this as the formation corresponding to the magnesian limestone of England, and to the rauchwacké and zechstein of Thuringen.

* * * * *

“The features which we observed from the Wassemon to the Wisconsin are extremely interesting. At a distance of a few miles northwest of the former stream, the vegetation presented a sudden and striking change, announcing a corresponding one in the geological character of the country. We ascended a rough, steep, and hilly ground, which was covered with heavy timber, and with a very thick underwood, consisting principally of young oak and aspen. This thick brushwood continued for about two miles, when we struck the bank of a small stream remarkable for the beauty of its scenery, which differed from any that we had hitherto met with. The brook runs in a deep and narrow glen, the sides of which are very steep, and, in some places, vertical. They are covered, at their summit, with a dense vegetation, which extends over the edge of the rock, and imparts a character of austerity and of gloom to this secluded valley, which finds not its parallel in any that we recollect ever to have seen.* The dark color which the water receives from

* This stream is an upper branch of the Pectanon, on its right bank, about 8' south of lat. 43°. It may not be easily comprehended by some of our readers, how a valley exceeding all others in austerity and gloom could be remarkable for the beauty of its scenery. We are quoting only the

the deep shadows cast by the high, steep bank and its overhanging vegetation, forms a pleasing relief to the glare, so uniformly fatiguing, of the unsheltered prairie. This spot conveyed so much relief to the eye and to the mind, that the party could not repress their delight on beholding it. The geologist who connects a change in the nature of the subjacent rock, with a diversity in the character of the country, or its vegetation, would naturally find an explanation for the new features which the country assumes, by observing that the high banks of this glen are formed of sandstone rocks, the nature of which we had an opportunity of studying with attention during a great part of our journey of the 18th of June. We observed that the sandstone is distinctly superposed to the limestone; that it constitutes, upon it, hills which vary from 30 to 100 feet and upwards; these hills are divided by valleys, in the bottom of which the limestone reappears in place. The sides of the hills are steep, and but few indications of stratification are observable, except where the valley is partly excavated in the limestone itself; in which case the lower part of the hill is less steep, but presents a distinct stratification. The line of superposition of the sandstone over the limestone may also be traced with considerable accuracy, by the examination of the vegetation. Whenever the latter rock prevails, the surface is even and smooth, or modified by gentle swells covered with a thick and long grass, and forming an uniform fine green, meadow-like country, while the sandstone invariably imparts to the surface an asperity which is as distinct as the vigorous growth of trees with which it is covered, and as its abundant undergrowth which denotes a strong and productive soil, having a tendency to bear heavy forests.

geological facts of the author, and our readers are at liberty to differ in matters of taste.

“The rock is a white sandstone formed of fragments of fine transparent and colorless quartz, united by a cement, which, in some parts, appears to be ferruginous, while, in others, it is colorless, and probably of a calcareous nature. In some parts the cement is quite invisible, and would almost lead to the belief that the union of the grains was a crystal-line one. This sandstone appears in fragments or tatters, and constitutes the remains of a formation which probably covered the whole of the limestone, at least in this part of the country. That it is above the limestone no doubt can exist in our minds, as we saw the immediate superposition. It sometimes appears, it is true, to sink below the level of that rock, and this led us, at first, to apprehend that there might be an alternation of strata, but a careful examination of all these spots has left no doubt in our minds, that in these cases the sandstone is deposited in coves or valleys formed in the limestone previous to the deposition of the sandstone. The cases are, however, not common, and we may safely state, as a general rule, that not only the sandstone is relatively above the limestone, but that it is even, in almost all cases, at a greater absolute elevation, and the spot at which we first met with it, west of the Wassemon, was considerably elevated above the usual level of the limestone; for wherever the sandstone has retained its position, it has protected the limestone against decomposition, and hence, in such places, the latter rock still continues to rise to a higher level than where it is laid bare, and exposed to the destructive influence of atmospherical agents. We also observed very distinctly, that while the valleys formed in the limestone at a time anterior to the deposition of the sandstone were few, those produced subsequently were numerous, as was indicated by the great roughness and unevenness of the sand

stone country, and by the many undulations in the uncovered limestone which we have already had occasion to mention. From the observations made on the 18th, it was thought very probable that all the hills observed at a distance on the 17th, were formed of this sandstone; and from some characters which had appeared at the time to present an anomaly it was inferred that the Enneshoteno or Twin Mountains, near which we had passed that day without stopping, were probably also remains of the general sandstone formation which extended over the whole country. No organic remains were observed in the sandstone, or in the limestone which underlays it, but no doubt can exist that they may contain some, and that the limestone probably contains many.

“Proceeding towards the Wisconsin, the country presents an alternation of rolling and undulated prairie, interspersed with hills composed of either one or the other of these rocks. The sandstone is found in most places to be covered with thin, flattened fragments of a stone differing in its nature and texture from the character of the other rocks, whether of limestone or sandstone. These fragments are generally observed to vary from three to twelve inches in length, from two to eight in breadth, and from one quarter to one inch in thickness. They present appearances of having been weathered, but not of having been rolled. They are very abundant, and we could account for them in no other way than by admitting that they were the remains, probably the harder parts of a stratum that had at one time covered the sandstone, but that had disappeared almost entirely, leaving only these fragments to attest its former existence and situation. On examining these fragments with care, we found them to be very uniform in their characters. Their composition is, in great measure, calcareous, but from their greater hardness

we consider it as partly siliceous.* They are replete with organic remains. They are principally referrible to the productæ, terebratulæ, &c. We saw none but what belonged to bivalves. The existence of these fragments was observed upon many elevations, over a considerable extent of country, while in the valleys no trace of them could be seen. Generalizing the observations made during the three last days of our journey previous to our arrival on the Mississippi, we are led to admit that there are, or rather that there were formerly, two distinct formations of limestone in this country, and that they were separated by a thick stratum of sandstone. Of these two limestone formations, the older one, which we have already described with minuteness, we have been induced to consider as coeval with, or analogous to, the magnesian limestone of England. The superior formation is distinguished by the circumstance of its containing harder fragments or nodules of limestone, which alone remain to establish the fact of its former existence: that it contained no hornstone or flinty quartz, as observed in the former, we are led to believe, because had they existed, they must necessarily have resisted decomposition, as well or better than the calcareous nodules which are now found alone. The much greater abundance of shells in these nodules, and the total absence of the madreporites, appear to us to be very characteristic distinctions between these and the underlying limestone, though perhaps too much weight ought not to be assigned to the absence of the madreporites, as these, from their loose and more porous texture, may have been unable to resist the decomposing causes which appear to have affected this formation. In some places a limestone bed was

* There are localities occasionally on both sides of the river, where the surface of the ground for a small distance is covered with these chert fragments.

observed upon the sandstone, but these depositions were so partial, and in all cases the ground was so much overgrown with bushes, that we were unable to examine their characters with any degree of minuteness. This striking difference, however, we observed, and we are led to consider it as constant, that the inferior limestone, wherever it appears exposed, is covered with small scales or fragments of the hornstone nodules whose existence has already been alluded to, while none of the flat calcareous fragments, abounding in shells, are found upon it ; whereas these were uniformly observed to the exclusion of the scales of hornstone upon the surface of the calcareous stratum that overlays the sandstone."

Mr. Keating gives the following further account of his examination of the St. Peter's :—

"The bluff upon which the fort is built offers a good opportunity for observing the geological structure of the country. It consists of several strata, all disposed in parallel and horizontal superposition. On the surface of the ground blocks of limestone are found, which appear to be the remains of a stratum that has, in great measure, disappeared. These are, in most cases, of a compact and earthy texture, destitute of any organic remains, exhibiting occasional specks of a crystalline nature, which are observed to be calcareous, as, notwithstanding their small volume, they present a distinct rhombohedral cleavage. The first stratum which is observed is about eight feet thick. It is formed of limestone, presenting a very distinct slaty structure. The texture of the rock is compact, its fracture splintery and uneven. Organic remains abound in it. These are, as far as we saw, exclusively producti. They lie in the rock as thick as possible. A small vacant space is generally observed between the inner and the outer casts of the shell. This is, however, generally

filled up with a crystallization of calcareous spar. The form of the crystals cannot be made out, on account of their extreme tenuity. The color of this limestone, as well as of the loose blocks found upon it, is a light greyish-yellow. This stratum rests upon another calcareous bed, which differs from the preceding, in the total absence of organic remains, and in its color, which is of a light blue. Its structure is more compact; so is its fracture. Its horizontal stratification is distinct, but, the stratum being thicker, it is more susceptible of being used in building. It produces, in fact, an excellent stone, which admits of being hewn, and which is the chief material used in the construction of the fort. This bed is from fifteen to twenty feet thick. When examined with the microscope, the rock presents very general signs of crystallization, its texture becomes sub-saccharoidal, and veins of calcspar, of an inconsiderable thickness, traverse it in every direction. There are, also, cavities in which crystals of carbonate of lime are distinctly seen. Independent of the building-stone which it yields, this bed is likewise valuable as producing the best lime of any found in the vicinity. Immediately under this bed of limestone, in parallel stratification, we observed the sandstone, which constitutes the principal mass of the bluff, being about sixty feet in thickness. It is a very friable stone, and, in some cases, the grains of which it is formed are so loosely united, that it appears almost like sand. Every fragment, if examined with care, seems to be a regular crystal, and we incline much to the opinion that this sandstone must have been formed by a chemical precipitation, and not by a mere mechanical deposition. The process of its formation may have been a very rapid one, such as is obtained in the manufacture of fine salt; and to this may be attributed the circumstance of its loose texture. The grain is very fine. Its color is white,

sometimes a little yellowish, in which case it resembles in texture, color, &c., the finer varieties of Muscovado sugar. The loose texture of the rock is, probably, the cause of its presenting but few indications of stratification. The rock which we have just described rests upon a slaty limestone, which has a striped aspect; the stripes or zones are curved. This limestone appears to be very argillaceous, and is a little softer than the preceding; its structure is quite earthy; it effervesces strongly in nitric acid; its color is a light yellow. The thickness of this bed is about ten feet. Below this, another stratum of limestone is found, which imbeds small black pebbles of quartz, and assumes, therefore, in a slight degree, the character of a pudding-stone, or conglomerate. Its grain is more crystalline than that of the preceding stratum. It is filled with small cavities, probably the result of a contraction during the consolidation of the mass. Its color varies from a bluish to a yellowish-grey. This stratum is about seven feet thick. It rises but four feet above the level of the water, and the only rock visible under it is another variety of limestone, which differs from the preceding, inasmuch as its grain is much finer and its texture more earthy. It is only visible for four feet. The bed of the river appears to be excavated near the fort in this stratum of limestone. Neither of these limestone formations, under the sandstone, contains any traces of organic remains. If we consider the three inferior beds of limestone as being modifications of the same formation, as we, doubtless, ought to do, then we shall find this bluff to be composed of three different formations—a superior one of lime, with abundant impressions of shells in one of its beds; an intermediate one of sandstone; and an inferior, calcareous formation, without any organic remains. The latter certainly bears some resemblance to the limestone

found on the Wassemon, though we are unwilling to pronounce upon their identity.

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"It would remain for us, in order to complete this view of the geology of the Falls, to inquire whether the limestone observed at the falls corresponds with that superior to the sandstone south of the Wisconsin; and if that found near the level of the river at the fort be analogous to that observed under the sandstone between the Wisconsin and Wassemon. We shall not affect a degree of certainty which we do not possess, but we may be permitted to advance an opinion that the sandstone is probably of analogous formation, and that, therefore, the strata of limestone which we found at the Falls correspond with that stratum, of whose existence, at a former period, between the Wassemon and Wisconsin, we think we have evident proofs. We have in our possession specimens taken in both places, filled with, apparently, the same organic remains, and exhibiting characters in the rock which correspond as well as could be expected from pieces collected at three hundred miles' distance from each other."—*Long's 2d Exped.*, vol. i., p. 306, et seq.

Extracts from the Report of a Geological Exploration in part, of Iowa, Wisconsin and Illinois. By D. D. OWEN.

"Throughout the Western States, generally, the secondary formation prevails, covered up in various locations, sometimes to a considerable depth, by recent alluvial and diluvial deposits.

"This secondary series of rocks comprehends various subdivisions of distinct character and invariable succession, which, in their turn, have been again subdivided.

"Of these groups, the mountain limestone particularly claims our attention, as almost all the rocks of Iowa and Wisconsin are referrible to that subdivision.

"In the western States, above-mentioned, these subdivisions generally vary in thickness from one hundred to one thousand feet, with the exception of the cliff limestone, which, in some districts, is hardly distinguishable, and, in general, does not exceed one hundred feet in thickness.

"Now, this cliff limestone, so sparingly developed elsewhere, swells, in the Wisconsin lead region, into the most remarkable, most important, and most bulky member of the group. It becomes, as it were, the Aaron's rod, swallowing up all the rest. It attains to a thickness of upward of five hundred and fifty feet, while the underlying blue limestone, which, in Ohio, has usually from eight hundred to one thousand feet of thickness, shrinks, in many places, to less than one hundred feet, and, in others, seems wholly wanting; while, at the same time, the black slate, commonly found above the cliff limestone, seems also deficient; and it is doubtful whether the fine-grained limestone, or the oolitic limestone, or the conglomerate, can be detected at all throughout the entire tract of country which has been subjected to exploration.

"In a word, in the region now under consideration, the cliff limestone, with a variable and usually thin substratum of blue limestone, seems to engross the entire mountain limestone group; and the coal-measures, where found (namely, in the extreme southern boundary of the tract), occur in immediate contact with it, instead of being separated, as usual in Ohio and the neighboring States, by three distinct members, occupying about one thousand feet in thickness.

"This enormous development of one of the members of the mountain limestone group, and the almost complete obliteration

tion of the rest (with the single exception of the blue limestone, upon which, also, it much encroaches) is peculiar, so far as my observations in the Western States extend, to the district of country which is the object of the present report. In the north of this district, the cliff limestone appears to run out, the blue limestone and underlying sandstones coming to the surface. South, it disappears beneath the coal-measures. East, it seems to be chiefly covered up by recent deposits, extending, probably, in an east or southeasterly direction beneath these, across the States of Illinois and Indiana, into the State of Ohio. And west, so far as our examinations went, it is also chiefly covered up by recent deposits, occurring, however, occasionally, in the beds of the streams, and projecting, at first in cliffs, and at last only in low ledges, from their banks.

“The general geological character of the country explored may, then, be thus briefly summed up. It belongs to that class of rocks called, by recent geologists, secondary, and, by others, occasionally included in the transition series. It belongs, further, to a division of this class of rocks, described, in Europe, as the mountain limestone, or, sometimes, as the carboniferous, or metalliferous, or encrinital limestone. And it belongs, yet more especially, to a subdivision of this group, known popularly, where it occurs in the west, as the cliff limestone, and described under that name by the geologists of Ohio.

“This last is the rock formation in which the lead, copper, iron, and zinc, of the region under consideration, are almost exclusively found; and its unusual development, doubtless, much conduces to the extraordinary mineral riches of this favored region. It, therefore, demands, and shall hereafter receive, particular analysis and attention.

“In the northern portion of the district surveyed, an

interesting and somewhat uncommon feature in the geology of Western America presents itself. I refer to the strata (of considerable depth) which crop out along a narrow strip of the northern boundary-line of this district, and which are chiefly observable in the bluffs on both sides of the Wisconsin River, whence (if we may rely on the representations of Schoolcraft and others) they extend north even to the Falls of St. Anthony.

“These strata are interesting; first, as being the only instance known to me, in the Valley of the Mississippi, in which the rocks underlying the blue limestone can be seen emerging from beneath it to the surface; and, secondly, as apparently supplying an example of those alternations of neighboring strata, to which I have already alluded as being partial exceptions to the invariable order of geological superposition.

“Immediately below the substratum of blue limestone which constitutes the lowest member of the mountain limestone group, where it has been observed east of the Mississippi, there occurs, and shows itself in the Wisconsin bluffs, a stratum of sandstone, in some places of a deep red, and in others of a white color, resembling loaf-sugar; and thence called, in Dr. Locke’s diagrams exhibiting the sections on the Wisconsin River, *saccharoid* (or sugar-like) sandstone.

“Immediately beneath this succeeds a magnesian limestone, so similar to the cliff limestone, both in external appearance and chemical composition, as not to be distinguishable from it in hand-specimens, alternating with other layers of sandstone, similar to that above-described.

“The actual average dip of the rocks throughout the district, according to the observations made by Dr. Locke, is from nine to ten feet per mile, but it is occasionally much greater. For example, from the mouth of Turkey river to

Prairie du Chien, the blue limestone rises at an average rate of seventeen and a half feet per mile. The dip, however, is subject to undulations ; for instance, at Dubuque, the blue limestone does not show itself above low-water mark ; at Eagle point, a mile and a half up the Mississippi, it rises ten feet above low water ; at the mouth of the Little Makoqueta, four miles farther up, its height above low-water mark is forty feet ; at the mouth of Turkey river, twenty miles farther up, it disappears again beneath the waters of the Mississippi ; a few miles beyond this point, it emerges again to the surface ; and, finally, at Prairie du Chien, twenty miles above Turkey river, its upper surface has already attained an elevation of more than four hundred feet above the level of the Mississippi. The line of the greatest general dip is about south, ten to twenty degrees west.

“ The importance of these observations on the dip of the rocks, forming as they do the materials to calculate the thickness of each stratum at any given spot, is very great. Indeed, such observations are indispensable, before an accurate estimate can be formed of the value and extent of a mineral tract. They indicate, with much fidelity, the depth to which, at different points, a productive vein of ore is likely to extend.”

“ I have preferred and adopted the name of cliff limestone to designate this rock (though a popular rather than a scientific term), because it aptly expresses its most striking external characteristic, which imparts to the scenery of any country in which the rock abounds a bold and romantic character. I allude to its disposition to cleave vertically, and form perpendicular cliffs.

“ These mural escarpments, exhibiting every variety of form, give to the otherwise monotonous character of the landscape in Iowa a varied and picturesque appearance. Sometimes they may be seen in the distance, rising from out the

rolling hills of the prairie, like ruined castles, moss-grown under the hand of time.

" Sometimes they present, even when more closely inspected, a curious resemblance to turrets, and bastions, and battlements, and even to the loopholes and embrasures of a regular fortification. Sometimes single blocks are seen jutting forth, not unlike dormant windows rising through the turf clad roof of an old cottage ; and again, at times, especially along the descending spurs of the hills, isolated masses emerge in a thousand fanciful shapes, in which the imagination readily recognizes the appearance of giants, sphinxes, lions, and innumerable fantastic resemblances.

" The appearance of this rock is further modified by the peculiar manner in which it weathers. Numerous masses of chert (a variety of flint), and also many siliceous fossils, are interspersed through its mass ; and these, becoming gradually loosened by the action of air and water, drop out, and leave cavities of various shapes and sizes. Thus the rock is frequently found riddled with irregular holes, from a few inches to a foot in diameter, giving its surface a rugged and almost bone-like appearance. Frequently this variety in the composition of the rock gives occasion to an undermining process on the lower surface of a cliff, which gradually proceeds, until, perhaps, a towering and tottering column remains, supported on a contracted base, which threatens every moment to give way and precipitate the poised mass into the valley beneath.

" The cliff limestone of Iowa is, strictly speaking, a magnesian limestone, containing (by careful analysis of four separate specimens from different localities) from thirty-five to forty per cent. of carbonate of magnesia.

" It contains, on the average, from eighteen to twenty per cent of pure magnesia ; and by mere solution in sulphuric

acid, is capable of yielding no less than one hundred and ten to one hundred and twenty parts of crystallized Epsom salts (sulphate of magnesia), and sixty parts of gypsum (anhydrous sulphate of lime), from every hundred parts of the rock. So that if sulphuric acid can be obtained or produced at a sufficiently cheap rate in Wisconsin, Epsom salts may there be manufactured profitably, and to an unlimited extent. I have at present, in my laboratory, two hundred and thirty grains of Epsom salts prepared from two hundred grains of the rock.

"It is from magnesian limestone that the Epsom salts of commerce are now commonly procured.

"But though the cliff rock is a magnesian limestone, and though the proportions of carbonate of lime and magnesia, which chiefly compose it, indicate that it is even a chemical compound rather than a mechanical mixture, yet it cannot with propriety, nor without risk of misconception, be called the magnesian limestone, as a late writer on the geology of Upper Illinois has termed the corresponding formation between Chicago and Ottawa; since it is only a subdivision of the mountain limestone group, always occurring beneath the true coal-measures; whereas, the magnesian limestone of geologists (the zechstein of the Germans) is one of the lower members of the new red sandstone group, and overlies the bituminous coal formation.

"Phillips, speaking, as it would seem, of the great scar limestone of the north of England, which he there calls 'the great limestone,' says: 'It is considered to have produced as much lead as all the other sills put together.' This is pre-eminently true of the cliff limestone of Iowa and Wisconsin.

"The lead region lies, as will be remarked, chiefly in Wisconsin, including, however, a strip of about eight townships of land in Iowa, along the western bank of the Mississippi, the greatest width of which strip is on the Little Maquoketa,

about twelve miles from east to west, and including also about ten townships in the northwestern corner of Illinois. The portion of this lead region in Wisconsin includes about sixty-two townships. The entire lead region, then, comprehends about eighty townships, or two thousand eight hundred and eighty square miles ; being about one-third larger than the State of Delaware. The extreme length of this lead region, from east to west, is eighty-seven miles ; and its greatest width, from north to south, is fifty-four miles.

“ The boundary of this region commences on the Mississippi River, where the south line of township eighty-seven north, range four east of the fifth principal meridian, crosses that stream immediately below the mouth of the Little Tête des Morts ; and runs thence six miles due west, thence six miles north, thence six miles west, thence northwest diagonally through township eighty-eight, range two east, and township eighty-nine, range one east, both of the fourth [fifth] principal meridian, until the line strikes the fifth principal meridian, where the line dividing townships eighty-nine and ninety crosses said meridian line ; thence six miles north, thence six miles west, thence three miles north, thence three miles west, thence three miles north, thence three miles west, thence three miles north, thence three miles west, thence three miles north, thence three miles east, thence north to the Mississippi, which it strikes about seven miles below the mouth of the Wisconsin River, thence, crossing the Mississippi, it runs diagonally through township five, range six west, of the fourth principal meridian, to the northeast corner of said township ; thence six miles east, thence three miles north, thence eighteen miles east, thence three miles north, thence three miles east, thence three miles north, thence nine miles east, thence six miles south, thence twelve miles east, thence eighteen miles east, passing along the northern base of the Blue Mounds ; thence

twelve miles south, thence twelve miles east, thence twelve miles south, thence six miles west, thence six miles south, thence twelve miles west, thence six miles south, striking the northern boundary-line of the State of Illinois at the point where the line between ranges five and six east of the fourth principal meridian crosses said boundary-line; thence, with said boundary-line, six miles west, thence twelve miles or thereby south, to the southeast corner of section thirteen, township twenty-seven north, range four east of the fifth principal meridian; thence six miles west, thence three miles south, thence sixteen miles or thereby east, to the east bank of the Mississippi River, about five miles below the mouth of Fever River, and about a mile and a half below the place of beginning, already designated, on the western bank of the Mississippi.*

"This lead region is, in general, well watered; namely, by Peccatonna River, Apple River, Fever River, Platte River, Grand River, the head-waters of Blue River, and Sugar Creek; and on the Iowa side by the Little Makoqueta and the lower portion of Turkey River: all of these streams being tributaries of the Mississippi.

"The highest points within this region are the summits of the Blue Mounds, two hills of a conical shape, composed of chert and other varieties of flint rock, in the northeast portion of the tract, and rising to the height of one thousand feet above the Wisconsin River. The Platte Mounds, also of conical form, and about six hundred feet high, occupy nearly the centre of the lead region.

"These isolated and towering mounds, so conspicuous a

* "A few fractional townships, originally included in my special reports, within the lead region, have been, on re-examination, thrown out, as not strictly belonging to the district which is likely to afford productive veins of lead ore."

feature in the landscape of Wisconsin, are evidence of the denuding action to which, under the crumbling hand of time, the surface of our globe is continually subjected, and which the more durable siliceous masses of these hills of flint have been enabled partially to resist.

“The northern boundary of the Wisconsin lead region is nearly coincident with the southern boundary-line of the blue limestone where it fairly emerges to the surface. No discoveries of any importance have been made after reaching that formation; and when a mine is sunk through the cliff limestone to the blue limestone beneath, the lodes of lead shrink to insignificance, and no longer return to the miner a profitable reward for his labor. Indeed, the small quantities of lead ore which have occasionally been found in the blue limestone, occur in veins not much thicker than writing-paper, which have insinuated themselves into the slender streams of the stratification. This coincidence between the northern boundary of the productive lead region, and that of the cliff limestone, is an example of the practical utility and application of the geological divisions of the different formations. Even if not a single shaft had ever been sunk in Wisconsin, it might have been predicted, with probability, that this change in the formation would be strictly accompanied with a corresponding change in the productiveness of the lead veins.

“Mr. Carne has observed, regarding the metalliferous veins of Cornwall, that it is a rare circumstance when a vein, which has been productive in one species of rock, continues rich long after it has entered into another; and this change, he adds, is even remarked when the same rock becomes harder or softer, more slaty or more compact. Hence it was very unlikely that the Wisconsin lead ore, so rich in the cliff limestone, should retain the same rich character in the blue limestone, even had the structure of this last been equally adapted

to the bearing of lead. But, in truth, rocks of a schistose character, composed of extensible layers, and devoid of vertical fissures, like this blue limestone, seldom contain lead ore in quantity. Phillips, in his recent geological treatise, from which we have already made several quotations, justly remarks : ' It is not because of any peculiar chemical quality that limestone yields most lead ore on Aldstone Moor, but because of its being a rock which has retained openness of fissure. Gritstones, in many mining fields near Aldstone Moor, are equally productive ; but shales, as being soft extensible layers, have closed up the fissures, and their crumbling faces appear to have rejected the crystallizations which attached to the harder limestone, gritstone, and chert.'

" These remarks apply, with force, to the fissured cliff rock of Wisconsin, compared to the softer and more slaty-structured blue limestone beneath it.

" It will also be remarked, that the designated lead region is almost exclusively confined to the northern half of the cliff limestone formation of Iowa and Wisconsin ; which northern half is occupied by its middle and lower beds. The upper beds (lying in the southern portion of the district) do not, as already intimated, furnish productive veins of lead ore. The crevices in these upper beds seem to be less numerous, and either empty or filled with iron ore (hydrated brown oxide), or calcareous spar (crystallized carbonate of lime), to the almost entire exclusion of veins of lead.

" It follows, from the above observations, that the mines in the northern portion of the district are less likely to be productive to a great depth, than those along its southern and western boundaries.

" It follows, also, that, in the southern portion of the district not included by me in the productive lead region, mines of value may yet be discovered, by sinking shafts through

the upper beds of the cliff limestone to the lead-bearing beds beneath—unless, indeed, these lower beds should prove to be beyond the sphere of action where the lead has been produced. This latter contingency is possible; yet the richness of the mines in the southern and western portion of the lead district (at Apple river and Dubuque, for example), as compared with some of the northern mines, seems to indicate that the ore may still continue rich in the descending beds. Since, however, this is, as yet, an unsolved problem; and even if it were solved, as it would require much capital to sink shafts to the necessary depth, and since mines of this depth would doubtless be inundated with water, and require steam-engines to drain them, I have not considered it my duty to include this southern portion of the district within the bounds of the productive lead region; although, hereafter, should the easily accessible lodes be exhausted, and the demand for lead rapidly increase, it may become so.

“With regard to the magnesian limestone which underlies the blue limestone and sandstone strata, and comes to the surface of the extreme northeastern portion of the district, its similarity in structure and composition to the cliff limestone, including its disposition to form vertical fissures, and its probable identity with the rock formation in the Missouri lead region, might induce the expectation that it, also, would be rich in lead ore. It may be so; but the frequent occurrence of iron ore (brown oxide) in those townships where this formation prevails* (as in the upper beds of the southern portion of the district), together with the little success which has hitherto attended the search after lead ore within its confines,

* It is not improbable, from its similarity to the lead-bearing rock in Missouri, that this lower magnesian limestone, if it be extensive north of the Wisconsin river beyond the limits of our survey, may there yield productive veins of lead ore.

render it doubtful. As this formation occupies but a small corner of the district, the examinations were necessarily too limited to enable me to pronounce, with confidence, upon its lead-bearing character.

“ All the valuable deposits of lead ore which have as yet been discovered, occur either in fissures or rents in the cliff rock, or else are found imbedded in the recent deposits which overlie these rocks. These fissures vary from the thickness of a wafer to thirty or even fifty feet in thickness ; and many of them extend to a very great, and at present unknown depth.

“ The most common diameter of fissures filled with solid ore is from one to four inches.

“ In the Apple river diggings, one vein filled up with ore was reported to me as being, where then worked, four feet across ; but an experienced miner, living close to the Illinois line, in one of the richest spots in the district, informed me that he had never seen a solid vein continue, for any considerable distance, of greater thickness than one foot.

“ In the spring of 1828 there was a mass of lead ore found in an east-and-west crevice, at the Vinegar-hill diggings, about thirty-five feet in length, expanding in the centre to the width of six or eight feet, and terminating in a point at each end. It was a hollow, and its walls averaged about a foot in thickness, forming, as it were, a huge shell of mineral. This extraordinary natural chamber was cleared out ; a table spread within it on the 4th of July ; and a considerable company celebrated the national anniversary within its leaden walls, about sixty feet below the surface of the earth.

“ The formation of caverns, by the occasional expansion of the lead-bearing crevice to a considerable width and height, is not uncommon. The ceiling of such a subterranean chamber is commonly adorned with large, pendant, icicle-like sta-

lactites, which conceal from the eye of the spectator the rich lead ore which they encrust.

“ Upon the whole, a review of the resources and capabilities of this lead region, taken in connection with its statistics (in so far as it was possible to collect these), induces me to say, with confidence, that ten thousand miners could find profitable employment within its confines.

“ If we suppose each of these to raise daily one hundred and fifty pounds of ore, during six months only of each year, they would produce annually upwards of one hundred and fifty million pounds of lead—more than is now furnished by the entire mines of Europe, those of Great Britain included.

“ This estimate, founded (as those who have perused the foregoing pages will hardly deny) upon reasonable data, presents, in a striking point of view, the intrinsic value and commercial importance of the country upon which I am reporting ; emphatically, the lead region of Northern America.

“ It is, so far as my reading and experience extend, decidedly the richest in the known world.

COPPER ORE.

“ The copper ore of Wisconsin Territory forms an item in its mineral wealth, which would be considered of great importance, and would attract much attention, but for the superior richness and value of the lead, the great staple of the Territory.

“ This ore occupies, in the district under examination, the same geological position as the lead ore. It originates in the fissures of the cliff limestone. It has been spoken of, very incorrectly, as ‘float mineral ;’ as if, like the fragments of native copper sometimes found in the diluvium of Western

America, it had been conveyed to its present situation from a distance. This our examinations have disproved. Discoveries of copper ore have indeed been made on a sloping hill-side near Mineral Point, within three or four feet of the surface ; and there the ore was found disseminated and imbedded in an ochreous earth.* But on following this deposit to the opposite side of the ravine (on section twenty-two, township five, range three east of the fourth principal meridian), the copper ore was traced into a crevice, and a regular vein has there been worked to the depth of thirty or forty feet. The pieces of copper ore raised on this spot commonly weighed from a few ounces to ten or twelve pounds ; and one mass thence procured was estimated at five hundred pounds.

“The course of this copper vein is from southeast to northwest ; and if this line be produced either way, from the discoveries at Mineral Point, it will strike, almost exactly, the discoveries of copper ore northwest on Blue River, and southeast on the Peccatonna—a proof that the copper ore is not a superficial and vagrant deposit, but exists in veins of uniform bearing ; and that these veins are continuous, and in all probability extensive.

“It is found in several localities in sufficient abundance to repay well the labor of the miner. If there were a steady demand for copper ore in the Territory, the miners could afford, as I was informed by themselves, to raise copper ore at the same price as lead ore—namely, from one and a half to two cents per pound. It would be in good demand, and be extensively raised, but for the capital and skill necessary

* “This earth frequently contains particles, more or less numerous, of copper ore, and is then popularly termed ‘gozzin,’ and employed as a flux in the copper furnaces. The gozzin of Wisconsin yields, by analysis, from six to nine per cent. of pure copper—a large per centage for such ore.

to reduce it ; which are both far greater than the lead-smelter requires ; and, also, but for the scarcity of fuel. The copper ore of this region compares very favorably with the Cornwall copper ores. An analysis of a selected specimen of the best working Cornwall ore, and of three average specimens of Wisconsin ore, showed that the latter contains from a fifteenth to a third more of copper than the former.

“The Wisconsin ore is of a very uniform quality. There was shipped from Ansley’s ground, within a mile of Mineral Point, in the year 1838, to England, 50,000 pounds of ore ; which yielded (according to the statement of one of the gentlemen who shipped it) over twenty per cent. of pure copper. The average produce in the copper mines of Cornwall may be stated at eight per cent.

“There have been raised, at the Mineral Point mines, upward of a million and a half pounds of copper. At Ansley’s copper furnace, 135,000 pounds of this were smelted ; which yielded, ‘in a very imperfect smelting furnace,’ 12,000 pounds pure copper, or about nine per cent. Mr. Ansley stated that he had not been able to procure a smelter acquainted with the mode of reducing copper ore ; and it is impossible to say what the per centage might have been, had the reduction been conducted with skill, and in a well-constructed furnace.

“The Wisconsin copper veins may rank among the most important that have yet been discovered in the limestone formation. European copper mines in that geological group (as in Staffordshire, England), usually yield very sparingly. Cornwall, which is the greatest copper country in the world, is composed entirely of crystalline, and the lower stratified rocks, chiefly slate, associated with granite and porphyry. The celebrated Pary’s copper mine, in the island of Anglesea, occurs in a mountain composed of primary slate.

“ This may seem an argument against the probable productiveness of the Wisconsin copper mines. Yet the formations in this western hemisphere are on a scale so extensive, compared with those in most parts of Europe (witness a single coal field equalling Great Britain in area), that such an argument must be received with many qualifications. In addition to this, the indications in Wisconsin, as far as they have been observed, and the analysis of the ore, afford strong presumptive evidence that capital and skill alone are required to render copper-mining in this district, at least for some time to come, an advantageous and profitable adventure.

“ One of the difficulties which here occurs in reducing the ore—namely, the lack of fuel—is common to the richest copper countries in Europe. The Cornwall copper ore is conveyed partly to Swansea and other portions of Wales, and partly to Liverpool, to be smelted in a coal region; and the same vessels which thus convey the less bulky material to the more bulky (the ore to the fuel), return laden with coal to supply the numerous and powerful steam engines required for draining and other purposes at the Cornwall mines. And thus, in Wisconsin, if copper ore be raised in quantities, it may be necessary to convey it south to the margin of the great Illinois coal field—say to the mouth of Rock River. This would require a land carriage of from ten to thirty miles, and a water carriage of about 100. The Cornwall ore is transported to a greater distance than this.

“ It may be added, as an additional fact whereby to estimate the value of the Wisconsin copper ore, that, in some of the European copper mines, ‘ this ore does not contain above three per cent. of pure copper, and yet it pays for working.’ Also, that in some of the Cornwall mines, the ore is worked profitably at a depth of more than 2000 feet ‘ from the grass,’ as the phrase there is.

Finally, the Wisconsin copper ore derives additional value in consequence of being found in the vicinity of, and often in the same mine as, productive veins of

ZINC ORE.

"This ore, found both in Iowa and Wisconsin, usually occurs in the fissures, along with the lead. It is chiefly the electric calamine—the carbonate of zinc of the mineralogist. Though a solid ore, it has an ochreous, earthy aspect, often resembling the cellular substance of the bone: hence it is familiarly known among the miners by the name of 'dry bones.'

"Notwithstanding its intrinsic value, which will before very long be duly appreciated, it is at present an object of especial aversion to the miner of Iowa and Wisconsin. It frequently happens, in both Territories, that the lead ore in a fissure gradually diminishes, and eventually is entirely replaced by this zinc ore; or, as the disappointed workman, sometimes with a hearty curse, not very scientifically expresses it, 'the dry bone eats out the mineral.'

"At some of the diggings, large quantities of this carbonate of zinc can be procured. Thousands of tons are now lying in various locations on the surface, rejected as a worthless drug—indeed, as a nuisance. It is known to but a few of the miners as a zinc ore at all. An analysis of this ore proves it to be a true carbonate of zinc, containing forty-five per cent. of the pure metal.

"Sulphuret of zinc (sometimes called blende, and, by the English miner, 'black-jack') is also abundant in the Wisconsin mines. It contains from fifty-five to sixty-five per cent. of zinc, but is more difficult of reduction than the calamine.

"Sheet zinc is becoming an article of considerable de-

mand in the market, for culinary purposes, and as a covering for valuable buildings, instead of lead. But the chief consumption of this metal is in making brass, well known to be a compound of copper and zinc. In this process, the carbonate of zinc, previously calcined, is mixed with charcoal and granulated copper, and then exposed to a suitable heat. The common brass imported from England contains upwards of thirteen per cent. of zinc; that of Paris, a little less; and the fine brass of Geneva, used in the nicer parts of watch-making, contains as much as twenty-five per cent. of zinc.

“Large quantities both of copper and zinc are now imported from Europe into the United States, to supply the continually increasing demand for brass. It is not improbable that the district now under consideration might furnish of both metals a sufficient amount, at least for many years to come, to supply the entire United States with brass of home produce and manufacture.

“Of zinc, at least, there is assuredly a sufficient supply, not only for that purpose, but also for exportation. All the zinc now produced in Great Britain is trifling in quantity, and quite insufficient for the demand; so that a large quantity is imported annually into that island, chiefly from Germany and Belgium. The importation of zinc into England, in the year 1833, exceeded six millions and a half of pounds—a fact which may give us an idea of the importance of this metal as an article of commerce.

Among the productive mineral resources of Iowa and Wisconsin, the at present despised zinc ore may claim no contemptible rank.

IRON ORE.

“The iron ore of this district is of excellent quality, and in unlimited abundance. I explored, a few years since, in

company with Professor Troost, geologist of Tennessee, the iron mines of that State, which already furnish iron to a considerable portion of the Western States. And though I have seen no proof that iron exists in Iowa and Wisconsin, in deposits as extensive as in Tennessee, yet the locations of iron ore are numerous, and the quality of the ore, in general, is as good.

"In some of the townships, especially in the 'Missouri limestone,' on the Wisconsin river, iron ore was found scattered in innumerable fragments over the entire surface, and of a quality so rich as to be crystallized in much perfection. Near the Makoqueta, my sub-agents reported the discovery of large masses of iron ore, occurring over a very considerable district of country. The reports and specimens from that portion of the district induce me to believe that there iron ore can be found, on the surface alone, sufficient to supply several iron-furnaces for years to come.

"Some of the specimens from these localities are the richest and most beautiful variety of pipe-ore I have ever seen, exhibiting a miniature resemblance to the basaltic columns of Staffa, or the Giant's Causeway.

"Much of it is the hematite, the purest and most productive form of the hydrated brown oxide.*

"In many of these locations, where iron ore is found in abundance, fuel, water-power, and the limestone for flux, are at hand. In the northern portion of the district, however, the scarcity of fuel presents a serious obstacle to the establishment of productive iron-works.

"In Dr. Locke's report, under the head 'magnetical node,' will be found an interesting account of a remarkable magnetical phenomenon, which seems to indicate the presence of

* These ores of iron yield from 40 to 60 per cent. of the metal.

some enormous mass of iron, or (if the expression be allowed) some 'subterraneous iron-mountain,' which may resemble, except in position, that of Missouri. The locality indicated is on the Wapsipinecon; and the axis of this node, as Dr Locke's chart shows, is near the line dividing townships eighty-two and eighty-three, and about six miles west of the fifth principal meridian.

"The utility of magnetical observations on the dip and intensity of the needle, as an indication of the presence of iron, and perhaps, also, of great masses of the brown oxide, is indisputable; and I consider myself fortunate in having been able to add to the other materials whereby to decide the value of the various locations of mineral lands in this district, the delicate and varied experiments of Dr. Locke.

"The variation-chart appended to that gentleman's report shows a striking difference in the variation of the needle within a very short distance; and the greatest variation corresponds, in a remarkable manner, with the best locations of iron ore of which actual discoveries were made. If from this we may conclude that the variation is increased by the presence of large masses of ore, the above chart would usefully guide a further examination after the localities of iron ore in the district. It must, however, be remembered, that it is the protoxide which chiefly acts upon the needle, and that the same phenomenon may possibly be caused by comparatively small veins of that variety, as by a large mass of the brown oxide.

"The richness of the iron-veins in this district cannot be correctly known until mines shall actually be opened; which has not yet been done in any part of it. But more encouraging or more numerous surface-indications of an abundant supply of this useful metal can hardly offer themselves to the notice of the geologist. In a country more thickly set-

tled, and with skill and capital to spare, these would speedily cause and justify the employment of whole villages of workmen.

“To incidental causes alone, and not to any natural deficiency of material, must be attributed the custom of importing annually from England, into this country, millions of dollars worth of iron for railroads and other purposes. Enormous as is the produce of Great Britain’s iron-furnaces (amounting, in 1833, to fifteen hundred millions of pounds), we might rival it in America. How little here in the west, at least, we have hitherto improved our natural resources in this branch of commerce, is proved by the thousands of tons of rich iron ore which lie, unappropriated and useless, scattered over the territories of Iowa and Wisconsin.

“COAL.

“The great coal-field of Illinois extends its northwestern margin over ten or twelve townships of the district, chiefly on the western side of the Mississippi.

“One seam of coal only was discovered cropping out west of the Mississippi; and that was of indifferent quality, lying in the north half of section twenty-seven, township seventy-eight, range four east of the fifth principal meridian, on Duck creek. Several were found in the tongue of land which lies in the fork between Rock River and the Mississippi: one of them from five to six feet in thickness. The quality of this last is fair: and, in proportion as the coal-diggings extended, the quality improved.

“Several good seams of coal show themselves south of the district, within a short distance of its southern boundary; and there is no doubt that any required quantity of this fuel may be procured at no great distance from the mouth of

Rock River, which stream enters the coal-field about 23 miles above its mouth, and has several good seams exposed in the banks.

"The coal in this vicinity is sure to become valuable, and to be in great demand, for the reduction of such ores (especially copper ores) as are raised in those portions of the district which are deficient in timber. Some town in this neighborhood, or a little south, is destined to become the Swansea of Wisconsin, and to receive, in its numerous furnaces, the rich produce of the prairie mines, from the north and northwest.

"SALINES.

"Throughout the Western States, generally, no productive salines are found below the true coal-measures. They commonly occur in some of the lower members of the coal formation, especially in the white sandstones lying within that formation, and at no great distance from its margin. Such are the well-known saliferous rocks on the Kenhawa and Muskingum.

"As soon, therefore, as the character and extent of the geological formations in the district were ascertained, I ceased to expect the discovery of any productive salines, except, perhaps, in the extreme southern corner of the tract, where the great coal-field of Illinois stretches its lowest members over a few townships.

"Every surface-indication confirmed my expectations. No salt-springs, not a single salt-lick, no variegated shales, not one of the usual indications of salt, were discovered. Even in the southern townships, within the coal-formation, the thickness of the strata is so inconsiderable that the chance is very slender of reaching profitable brine. Salt, therefore, cannot be reckoned among the productive minerals of Iowa

and Wisconsin. It may, probably, be obtained along the head-waters of the western and northeastern tributaries of the Illinois River.

“ BUILDING-STONE.

“ I was, for a time, in doubt in regard to the value of the Wisconsin limestone as a building material. Where it has numerous nodules of chert distributed through its mass, it weathers unequally, the nodules become detached, and its beauty and value as a building-rock are much lessened. This occurs chiefly in the superior portion of the upper beds ; that is, over the southern portion of the surveyed district.

“ Much of the limestone that is taken from the diggings crumbles, also, on being exposed to the weather ; yet a portion of the formation will yield some of the best quarries in the world, and several excellent ones are already opened. For example, on the Sinsinnewa Mound, at Mineral Point, at the Four Lakes, and (but not so good) on the Peccatonica. This excellent building-stone chiefly occurs in the lower portion of the upper beds of the cliff limestone, and also in the lower beds of the ‘ Missouri limestone.’ It is of a beautiful uniform light-yellow color, compact, fine-grained, sharp-angled, capable of receiving a handsome finish, and, if well selected, calculated to endure, uninjured, for ages. It is very readily quarried in square blocks from six inches to a foot in thickness ; can be obtained, however, double or treble that thickness, and of any required horizontal extent. The labor of quarrying is light, in consequence of the rock being exposed in cliffs, so as to preclude the necessity of excavation.

“ In a recent geological notice from England, it is stated that Mr. De la Bèche, in conjunction with Mr. Barry and the

veteran father of English geology (William Smith), has been intrusted by the British government with the care of selecting the material of which the new houses of Parliament were to be constructed ; and, after a tour made in the course of last year for this express purpose, to the points where the best building stones were supposed to be quarried, they made choice of the magnesian limestone of Yorkshire, remarkable for the durability of its color, texture, and sharpest forms, as exemplified in the noble old churches of that country. But this magnesian limestone of Yorkshire, thus selected by some of the most experienced geologists in the world as the best building stone in England, is, as we have already shown, if not the equivalent of the cliff limestone of Wisconsin, a rock very closely resembling it. The inference is, that some of the strata of the cliff limestone of Wisconsin may be expected to furnish building materials of a quality the most superior.

“The canal engineers on Rock River complained much that they could find no durable building stone, having quarried in the white limestone which occurs in the margin of the great coal-field. This rock (at that point, at least) is little suitable for building purposes. Had these gentlemen ascended the Mississippi to the high land above the Makoqueta for material, they would have found quarries of the building stone above-described, and their locks might have bid defiance to the ravages of time.

“Near Iowa city, and in several other localities along the junction of the cliff limestone and the coal-measures, occurs a white limestone, which must not be confounded with the above. It is capable of receiving a good polish ; and, being studded with a beautiful fossil coralline (the stylina of Lesueur), forms a pretty variegated marble. One of my sub-agents found a settler building his milk-house of this showy material, in which the cyathophyllum of Goldfuss was

intermixed with the stylina. Its value as a marble may be considerable, should it be obtained in blocks of sufficient size. In polishing, however, the organic structure of the coralline causes cellular imperfection on its surface.

“ MILLSTONES.

“In section twenty-two, township eighty-nine, range three west of the fifth principal meridian, the United States surveyors had reported a ‘millstone quarry.’ There seems, however, to have been no better foundation for this report than the presence of some granite boulders, very numerous on the northern portion of the eastern boundary of the district, and also throughout the western ranges of Iowa. These erratic boulders constitute a peculiar feature in the prairie scenery, and are often of great size. One was reported to me by a sub-agent, somewhat indefinitely, as being ‘as large as a steamboat.’ A smaller one, afterwards measured, was eight feet high, and ninety feet in circumference. They are composed of granite, green stone, porphyry, and other primitive rocks.

“Similar boulders, in the State of Illinois, are, in default of more suitable materials, sometimes employed to make millstones; but the labor of the manufacture from these primitive rocks is very great, and a ‘millstone quarry’ of such a character cannot be considered of value.

“In the course of a geological reconnoissance of the State of Indiana (which, as geologist of that State, I had, two years since, occasion to make), I found good millstone quarries in a rock formation which is the equivalent of that of Wisconsin, and I hoped to make similar discoveries in the course of this survey; but I have seen no rock, either in Iowa or Wisconsin, which combines hardness and porosity enough to render it suitable for this useful purpose.

OTHER MINERALS.

"No minerals of much value, except those described in the preceding sections, were detected in the district.

"Chalcedony, agate, jasper, and cornelian, were found, but not in great perfection.

"On the southwest quarter of section seventeen, township eighty-four, range five east of the fifth principal meridian, in the Mineral Point and Blue River lead-mines, besides several other localities, was found a white rock, which, by disintegration, forms a white plastic material used in the manufacture of porcelain: it is a hydrate of silica, containing a small per centage of alumina, and is similar to that substance which forms what are misnamed the 'chalk banks,' below Cape Girardeau, Missouri. If obtained in sufficient quantities, it would be of value in the manufacture of porcelain; but I failed to discover any extensive or continuous stratum of this mineral. It has too large a per centage of silex, and too little alumina, to rank as a true kaolin.

"No appreciable quantity of silver was discovered in any of the ores of lead subjected to analysis; neither was any sulphuret of silver (as it occurs in the lead mines of the Hartz) found in this district.*

"In one or two specimens of galena, vestiges of arsenic were detected.

"Little or no antimony is found in combination with the lead ore of this district; a circumstance which increases the value of the ore, for lead ore contaminated with antimony is of difficult reduction.

"At McKnight's diggings, at Mineral Point, there occurs along with the galena the 'black lead ore' of the mineralo-

* Ores of silver are rarely, if ever, found in this geological formation.

gist, which is the carbonate of lead with a small admixture of sulphuret of lead.

" Crystals of the sulphato-tri-carbonate of lead have been obtained from some of the diggings in Wisconsin.

" Manganese, a metallic oxide, useful in various manufactures, was found (but not in a pure form, nor in very large quantities) among the earthy materials in the fissures of the cliff limestone.

" In some of the richest lead mines, very fine specimens of crystallized iron pyrites are associated with the sulphuret of lead—some of it (capillary pyrites) brilliant and delicate beyond any I had ever before seen. It is composed of fascies or clusters of silk-like threads, of a pale golden-yellow color, which may be readily separated with the point of a knife.

SOILS.

" An item in my instructions required me to report 'such facts as will serve to convey some idea of the value and productiveness' of the district under consideration.

" In obedience to this instruction, I have analyzed, with care, the soils of Iowa and Wisconsin; and the result of this analysis, extended to fifteen different specimens selected from the various parts of the district, is truly remarkable.

" It is a common, and usually a correct remark, that mineral regions are barren and unproductive. 'If a stranger,' as Buckland has well expressed it in the opening to his *Bridgewater Treatise*, 'if a stranger, landing at the extremity of England, were to traverse the whole of Cornwall and the north of Devonshire, and, crossing to St. David's, should make the tour of all North Wales, and passing thence through Cumberland, by the Isle of Man, to the southwestern shore of Scotland, should proceed, either by the hilly region

of the border counties, or along the Grampians, to the German ocean, he would conclude, from such a journey of many hundred miles, that Britain was a thinly-peopled, steril region, whose principal inhabitants were miners and mountaineers.'

"Not so the traveller through the mining districts of Western America. These afford promise of liberal reward, no less to the husbandman than to the miner; and a chemical examination of the soils gives assurance that the promise will be amply fulfilled.

"The mode of analysis adopted was, in its general features, the same which has been recommended by Dr. Dana, of Lowell, and adopted by the geologist of Massachusetts. I have carried it out, however, in regard to the salts found in the most interesting specimens, into more minute detail than that simple and practical, rather than rigidly accurate, mode of analysis presupposes.

"The following table, with the appended notes, exhibits, with sufficient accuracy for practical purposes, the proportions of organic and of earthy matter, the percentage of saline ingredients, and the specific gravity of each specimen of soil. The specimens were selected from the different formations—chiefly, of course, from the cliff limestone; they were taken from about six inches below the surface, and, with a single exception (No. 13), from wild lands. They may be considered a fair average of the virgin soils of the district.

Iowa and Wisconsin soils.

No.	LOCATION.	Loss by baking.	Organic matter soluble in alkali.	Organic matter insoluble in alkali.	Salts soluble in water.	Salts soluble in diluted muriatic acid.	Aluminous residuum.	Siliceous residuum.	Specific gravity.
<i>Wisconsin soils.</i>									
1	Prairie valley soil from east half of township 5 north, range 6 east of the 4th principal meridian.	6.5	6.0	6.0	3.0 prot and per-oxide of iron, lime, and magnesia.	1.0 chiefly oxide of iron.	0.0	75.0	1.30
2	Section 24, township 4 north, range 4 east of the 4th principal meridian.	0.6	3.0	0.3	0.9 lime, and a trace of magnesia.	0.8	1.0	93.0	2.33
3	Northwest quarter of section 15, township 5 north, range 1 west of the 4th principal meridian.	4.5	5.5	6.0	2.0	1.0	0.0	80.0	1.44
4	Northeast quarter of section 7, township 3 north, range 1 east of the 4th principal meridian.	2.5	5.0	5.0	2. 1.5 muriate of lime, a trace of magnesia.	0.7	0.0	84.0	1.80
5	Township 22 north, range 6 east of the 4th principal meridian.	3.0	6.5	5.0	3. 1.5 oxide of iron, a little lime and magnesia.	0.5	0.0	82.0	1.68
6	Rich valley soil on Platte River, from section 33, township 4 north, range 9 west of the 4th principal meridian.	7.5	11.0	15.0	4.5—0.5 oxide of iron, 2.0 lime, 0.3 magnesia.	1.5	0.0	60.0	1.24
7	Soil from one of the townships richest in lead ore, viz: township 1 north, range 1 east of the 4th principal meridian.	3.5	5.5	5.0	2. oxide of iron, lime, and magnesia.	1.0	0.0	83.0	1.64
8	Section 22, township 7 north, range 4 west of the 4th principal meridian.	3.5	7.5	6.0	2. 1.5 muriate of lime.	1.0	0.0	78.0	1.66
9	Northeast quarter of section 8, township 6 north, range 3 west of the 4th principal meridian.	4.0	2.0	7.2	1.8	1.5 chiefly oxide of iron; no phosphoric acid could be detected.	0.0	83.0	1.62
10	Section 8, township 6 north, range 8 east of the 4th principal meridian.	1.5	0.5	0.5	1.5 oxide of iron, a trace of lime and magnesia.	0.5	0.0	95.0	2.22

Iowa and Wisconsin soils—continued.

No.	LOCATION.	Loss by baking.	Organic matter soluble in alkali.	Organic matter insoluble in alkali.	Salts soluble in water.	Salts soluble in diluted muriatic acid	Aluminous residuum.	Siliceous residuum.	Specific gravity.
<i>Iowa soils.</i>									
11	Soil from the west side of Dubuque, from a flat valley.	3.5	4.5	6.5	3.5—1.3 lime, 0.3 magnesia, 0.8 oxide of iron.	0.5 chiefly oxide of iron.	0.0	81.0	1.62
12	Southeast quarter of section 25, township 89 north, range 2 east of the 5th principal meridian, from the ridge.	3.5	6.0	5.0	2.5—1.8 lime, 0.2 magnesia, 0.5 oxide of iron.	1. 0.5 alumina, 0.5 oxide of iron.	0.5	81.0	1.52
13	From near Dubuque River bottom, from a corn-field.	3.6	3.0	4.0	2.5 lime, magnesia, and a little oxide of iron.	1. -	5.0	86.0	1.92
14	Average soil from townships 84, 85, 86, 87, range 3 west of the 5th principal meridian.	4.3	3.0	4.0	1.5 chiefly alumina.	0.5 oxide of iron	2.0	85.0	2.08
15	Township 81 north, range 2 east of the 5th principal meridian.	1.5	3.0	1.5	1.0 chiefly lime.	0.5 oxide of iron	1.0	91.0	2.60
Average of 15 specimens		3.6	4.8	4.8	-	-	-	82.5	1.84

Note.—The saline matter insoluble in water, but soluble in muriatic acid, of soils Nos. 9 and 14, was tested for phosphoric acid, by fusing with carbonate of soda, dissolving with acetic acid, and adding nitrate of silver. No sulphur-yellow precipitate appeared indicative of phosphoric acid. Indeed, muriatic, a trace of sulphuric and carbonic acids, were the only inorganic acids which could be detected in combination with the saline bases. Oxide of iron appeared, in most cases the chief constituent of the saline matter insoluble in water. These virgin soils seem, therefore, to contain little or no phosphates.

"To a correct appreciation of the results obtained from the above table, it may be remarked, that the organic matter of the soil (sometimes called *geine*)—the food of plants—the substance, which, by the action of air and water, has been prepared, or is in course of preparation, to enter into the circulation of the plant,—is that portion of the soil which chiefly communicates to it its prolific qualities ; and that, all other things being equal, a soil may be expected to be productive, in proportion to the amount of organic matter it contains.*

"This organic matter is in part soluble, and in part insoluble, in alkali. The soluble portion of it is supposed, with much plausibility, to be that which is already prepared to become nutriment for plants ; the insoluble portion is regarded as that which, by the action of air and moisture, and other influences, will hereafter become so.

"If this theory be an accurate one, it follows that those soils which contain a large proportion of soluble organic matter will be fertile for the time ; but that they must also contain a good supply of insoluble *geine* to preserve their fertility. And thus the column of soluble organic matter in the table is that which measures the present productiveness, and that of insoluble organic matter that which indicates the durability of the soil.

"The salts which enter into the composition of a soil are considered by agricultural chemists as its stimulating ingredient. Chaptal, in his 'Chemistry applied to Agriculture,' says (a little fancifully, perhaps), 'The salts are to plants, what spices and marine salts are to man.'† It is certain that

"* An exception to this rule, which should not be overlooked, exists in the case of bog or peat soils ; which, however, possess in general but little soluble organic matter."

"† Dr. Dana improves on this idea. He says: 'The earths are the plates, the salts the seasoning, and the *geine* the food of plants.'"

the salts in any soil exert upon the organic matter a chemical action, and contribute to regulate and facilitate the process of nutrition. Without an adequate supply of saline material, then, a soil lacks one of the essential ingredients of fecundity.

“To form an estimate, from the above table, of the quality of the Wisconsin soils, it is necessary to compare its results with similar results obtained in countries in which, by actual culture, the value of the soil has, to some extent, been proved. The difficulty here is, that such analyses of soils have very rarely been made or recorded. Professor Hitchcock, in his Report, of the year 1838, on the Economical Geology of Massachusetts, furnishes a valuable table of this kind, exhibiting the analyses of one hundred and twenty-five specimens, which, as he informs us, may be considered as about the average quality of the soils of that State. He adds: ‘As this is probably the first attempt that has been made to obtain the amount of geine in any considerable number of soils, we cannot compare the results with those obtained in other places. They will be convenient, however, for comparison with future analyses.’

“And they do accordingly furnish data for a comparison, both interesting and important, between the soil of Massachusetts and that of Wisconsin.

“The following are the results obtained from Professor Hitchcock’s table :

Average quantity of soluble geine (organic matter)	-	-	-	-	-	3.90 per cent.
Average quantity of insoluble geine (organic matter)	-	-	-	-	-	3.70 per cent.
Average specific gravity of soil	-	-	-	-	-	2.44 “

"My own table, as will have been remarked, shows the results for the soils of Iowa and Wisconsin to be—

Average quantity of soluble organic matter - 4.80 per cent.

Average quantity of insoluble organic matter 5.13 "

Average specific gravity of soil - - - 1.84 "

"The first result which strikes the eye is the large amount of organic matter in the Iowa and Wisconsin soils, compared with those of Massachusetts—nearly one-third greater.

"The second is the great specific gravity of the Massachusetts soil, compared with those of Iowa and Wisconsin—nearly one-third greater.

"A more careful inspection shows that the amount of organic matter is, almost to mathematical accuracy, in the inverse ratio of the specific gravity of the soils.

"It would be a hasty inference thence to deduce the conclusion that soils are rich in geine, in proportion to their specific lightness ; yet the coincidence, in this respect, is marked and worthy of attention.

"If further analysis of soils in various portions of this and other countries should exhibit similar results, it would appear that a simple trial of the specific gravity of a soil may, in a general way, furnish an approximating test of its fertility.

"Be this as it may, the dark mould which prevails over a large proportion of Iowa and Wisconsin, so rich in geine, and of so small specific gravity, has proved itself, wherever the farmer has trusted to its certain returns, instead of attempting the more hazardous venture of the mine, an excellent and productive soil ; especially adapted to the culture of every species of culinary vegetables and small grain, and producing, probably, as good Indian corn as the State of New York, or any other State of the same latitude.

"It will be observed, from the table, that the power of

absorption is generally in proportion to the amount of geine and the lightness of the soil.*

"This is an important item to the cultivator. Lands possessing this power in a considerable degree readily absorb the dew in dry weather ; and, in wet weather, do not suffer the superfluous rain to accumulate on the surface.

"A striking feature in the character of the Iowa and Wisconsin soils, as the table shows, is the entire absence, in most of the specimens, of clay, and the large proportion of silex. This silex, however, does not commonly show itself here in its usual form—that of a quartzose sand. It appears as a fine, almost impalpable, siliceous powder, frequently occurring in concreted lumps that resemble clay ; and, indeed, it was often reported to me incorrectly as clay—an error ultimately detected by analysis.

"This almost impalpable powder, the chief constituent and almost sole residuum of the Iowa and Wisconsin soils, is so highly comminuted, that, when examined under the microscope, for the most part, its atoms present no crystalline or even granular appearance.

"This fine siliceous residuum, after being boiled with strong aqua regia, lost but 10 per cent. ; of which but 5 per cent. was alumina.

"This absence of any material per-centage of clay in the soils under consideration prevents the rolling lands from washing away ; and it imparts to the streams a crystal clearness, which even after heavy rains is hardly disturbed. The appearance of these transparent rivulets flowing over a soil,

* "In general, the more finely the parts of a soil are divided, the better they absorb water."—*Chaptal*.

"This applies particularly, as the sequel will show, to the soils in question."

which when moistened by rain is often of an inky blackness, arrests, by its singularity, the eye of a stranger.

“Whether the lack of clay in the Iowa and Wisconsin soils will render them less durable, may be doubted. A coarse sandy soil, the open pores of which suffer the rain to percolate, carrying with it the nutritive geine from the surface, requires an admixture of clay before it can become rich and durable ; but the minute grained siliceous powder of this district forms a species of soil entirely different from the above—one which, without any such admixture, retains moisture and geine in much perfection.

“I believe it to be peculiarly adapted to the growth of the sugar beet, which flourishes best in a loose fertile mould, and which has of late become, in some European countries, an important article of commerce. It is estimated that the amount of beet sugar manufactured in France during the last year was 100,000,000 pounds, and in Prussia and Germany 30,000,000 pounds. In the western part of Michigan, in as northern a latitude, and in a climate similar to that of Wisconsin, 240,000 pounds are reported by the papers of that state (how accurately I know not) to have been manufactured during last season.

“In concluding this brief notice of the soils of this district, which I regret that time does not permit me to extend, I may add, that I know of no country in the world, with similar mineral resources, which can lay claim to a soil as fertile and as well adapted to the essential purposes of agriculture.”

(B.)

Extract from Mr. Owen's Report to Congress.

" EARTHWORK ANTIQUITIES IN WISCONSIN TERRITORY.

" I present this subject, not as a discovery, but merely to add such evidence to the discoveries and publications of others as seem, from the doubts I have heard so repeatedly expressed, to be necessary to convince the majority of readers of their correctness. In the 34th volume of 'Silliman's Journal,' is a communication from Richard C. Taylor, Esq., on the subject of these identical works, in which he describes them as being 'in the form of animal effigies.' The figures given by Mr. Taylor are so unlike any ancient tumuli in other parts of the country, that I had, ever since noticing them, felt a strong desire to examine the originals. On entering Wisconsin, I was so engaged in other pursuits, that I had forgotten the 'effigies,' until, upon examining the 'sandstone bluffs,' eight miles east of the Blue Mounds, I literally stumbled over one of them, overgrown with the rank prairie grass. I was at once convinced of the correctness of Mr. Taylor's representations, and not a little astonished that some well-informed per-

sons there, in the midst of these strange groups, should still pretend to dispute their artificial origin. The same ambition to exercise an independent judgment might lead the same individuals to dispute that the ruins of Herculaneum are artificial; the same argument might be used—‘that they just come so in the earth.’ Without going into any discussion in regard to the origin, history, or design of these figures, I shall merely represent their form and dimensions with as much accuracy as a very particular survey of a few of them enabled me to attain. I shall not even pretend to say that they are like animals; for this the reader can determine for himself. I have not attempted, in any degree, to represent them as they might once have been, but exactly as I found them on the day that I surveyed them.

“The method pursued in making the surveys is represented in plate No. 1, Antiquities. Here, for convenience, I make use of the names of the parts of an animal. The figure delineated is the foremost one of the two, between which the road passes, and which are on the verge of a small prairie, about ten miles east of Madison, the capital of Wisconsin. Small stakes were set in the following points, viz: the eye, the fore foot, the shoulder, the hip, the hind foot, and the end of the tail. The angular positions of these and other points were determined by measuring, with a tape measure, the sides of the several triangles which those points form, in such a manner that the determined side of one triangle shall be the base of a new one. After the determination of all the triangles, their several diameters and distances were measured and noted; and, finally, to determine the bearing of the whole figure, the magnetical bearing of the line from the hip to the shoulder was registered on the field-book.

The following is a copy from the field-notes, in reference to the above figures:

Triangles.

					Feet.	Inches.
Eye to shoulder,	-	-	-	-	23	0
Shoulder to foot,	-	-	-	-	29	4
Fore foot to eye,	-	-	-	-	37	8
Eye to nose,	-	-	-	-	20	4
Nose to shoulder,	-	-	-	-	35	10
Eye to point half way between the ears,	-				11	0
Shoulder to same point					24	10
Shoulder to hip	-				38	4
Fore foot to hip	-				57	0
Shoulder to hind foot					47	8
Hind foot to hip	-				28	10
Hip to the tip of the tail					38	0
Hind foot to the tip of the tail					41	6

" Diameters.

					Feet.	Inches.
Of the neck	-	-	-	-	13	0
Of the fore leg	-	-	-	-	11	0
Of the body	-	-	-	-	14	7
Of the hind leg	-	-	-	-	9	9
Of the tail	-	-	-	-	8	0

" Distances.

					Feet.	Inches.
From the eye to the front	-	-	-	-	7	6
From one ear to the other	-	-	-	-	14	0
From shoulder to armpit	-	-	-	-	9	9
From shoulder to back	-	-	-	-	8	4
From hip to rump	-	-	-	-	7	0
From hip to flank	-	-	-	-	9	7
From hip to insertion of the tail	-	-	-	-	7	6
Length of the throat	-	-	-	-	12	0

Observations.—Ears distinctly separated. Two trees, sixteen inches in diameter, growing in the nose. Ground sloping gently towards the feet. Both the fore and hind legs curved a little backwards. The tail a little hollowed on the upper side. Height, or relief of the figure above the natural surface, about three feet; and the back somewhat steeper than the belly. Bearing of hip to shoulder N. 38° W.

“It will be seen, by examining the above notes, that they determine twenty-five points in the circumference of the figure; and that the connecting of these points by lines, and thus completing the outline, permits no exercise of imagination. The figure from the earth is simply transferred to the paper, on a scale of the one hundred and twentieth part, in linear dimensions. Seven other figures were surveyed with the same degree of particularity, and the distances between them and the relative positions of the same group accurately noted.

“The ‘military road’ from Prairie du Chien to the Four Lakes, after crossing the Wisconsin River, and ascending a small tributary, occupies the height or dividing ridge between the waters of the Wisconsin on one side, and those of Rock River and some smaller streams on the other, for the distance of eighty or one hundred miles, occasionally descending into a moderate valley, and crossing a small rivulet, a head branch of some of the incipient streams. Most of the route is on a high open prairie. From the Blue Mounds eastward to the Four Lakes, the country abounds with the earthwork antiquities, of the origin of which the present aborigines are as ignorant as ourselves. About seven or eight miles eastward from the Blue Mounds, the road descends into the valley of a head branch of Sugar River, a tributary of Rock River;

and here, near a bluff of sandstone, of a very picturesque and fantastic outline, commence our particular descriptions.

“There is a group of works about eight miles east of the Blue Mounds. It is on the great road from Prairie du Chien, through Madison, to Lake Michigan—a road so decidedly marked by nature, that I presume it has been the thoroughfare, the ‘trail,’ the great ‘war-path,’ ever since the region in the vicinity has been inhabited by migrating man, and will continue to be his pathway until the hills and the rivers exchange their places. The sand-bluff surmounted with pines is here a picturesque object; and the streamlet and springs not very distant, with a few scattering trees for fire, have long made it a camping ground. Mr. Taylor has represented only one of the two ‘effigies’ which occur at this point; the other was probably so overgrown with grass and small hazel-bushes as to escape his observation. Our encampment was near this place; and in the midst of some discussion with regard to the tumuli, they were opened to see whether they were stratified, and whether the black mould continued underneath them, even with the surrounding surface. No. 2 was composed of sand, without any change to mark an original surface below, although it is now overgrown with grass, and is covered with a thin black mould. The whole of this descent, near the bottom of which the figure lies, has evidently been formed by the disintegration of the soft incoherent sandstone bluff contiguous; and at the time of forming this tumulus, it was very probably destitute of loam at this point, as it now is at a point still nearer the bluff. A section of the embankment near the gap exhibited a thin line of this loam, even with what might be supposed to have been the original surface of the ground. Alluvial stratification is positive proof that a formation is not artificial; but the absence of a base of mould is not positive

proof of the same thing; for the constructors may have removed the surface on commencing their work. Many of our tumuli have not only a base of mould marking an original surface, but ashes, coals, bones, and artificial implements deposited at the bases of tumuli, of various forms and heights, from two to seventy feet.

"In examining the tumuli of Wisconsin, I did not at any place discover a ditch or cavity from which the earth to construct them had been taken. They abound along the natural road, occupying the fertile and commanding hill-tops, and the gentle slopes into the valleys; being uniformly raised from a smooth and well-formed surface, always above inundation, and well guarded from the little temporary currents produced by showers.

"The backs of the 'effigies' were uniformly placed uphill, and the feet downward, as at the sand-bluff. There are some points on the surface of soft ground where we naturally expect chasms, rugæ, mammillary points, and undulations. These occur from the uprooting of trees, from avalanches, from the settling of banks, from the action of temporary streams and currents of water. Mammillary points are often left along the sharp crest of a hill, and insular mounds are not unfrequently left in low alluvial bottoms—certain points of upland having withstood that action of the currents which has carried away and degraded the surface to a lower level. But there are other situations where we expect to find, and do actually find, the surface evenly graded into smooth undulations, as on the dividing tables between the heads of streams, and in the tops of moderate hills, where no current has room to accumulate; and especially if the same region be prairie, with the surface protected by the strong roots of wild grasses.

"Just such a situation is this part of Wisconsin where the

geologist suddenly and unexpectedly meets with these groups of gigantic basso-relievos, which appear to him as decidedly artificial as the head of Julius Cæsar on an ancient coin, notwithstanding anything which may be imagined or said to the contrary.

[Another] "figure is about one mile and a half from the bluff above described. It appears to be solitary; lies on a low, level, smooth ground, and seems to have been mutilated; the parts which I have called the legs seem to have been partially washed away. If intended to represent an animal, the head is evidently too large, and the attitude very stiff and rectangular. But I have drawn it as I found it, without any inclination to make it more like an animal than it was made in the original design, with all the defacements which several hundred years have imprinted. The distance from this third figure to the next group is diminished on the plate. It is really one-fourth to one-third of a mile, where, on our progress towards Madison, we approach the termination of the valley in which our figures, so far, have been sketched. Here, upon the side of a hill sloping gently toward the road, are three figures, and an embankment; the sizes, distances, and relative positions of which have all been drawn to a uniform scale of forty feet to the inch.

"Leaving the group last described, and proceeding still eastwardly towards the Four lakes, we ascend a ridge, and pass out of the valley containing the six figures [above described]. The road for about two miles lies over broken, thinly-timbered ridges; beyond which it crosses a small prairie, and again enters woodland. Just at the entrance of this woodland are two [other] figures. The pathway passes, with scanty space, between the nose of the one and the tail of the other. These are the most perfect, if we consider them as 'effigies' of animals, of any of the figures here re-

presented, and are singularly alike in their form and dimensions. A short distance (500 or 600 feet) to the west of them is a natural swell of ground, with an artificial tumulus on the top of it, overlooking the two figures.

“If these figures were originally intended to represent animals, they might have been much more distinct and specific than they now are. It is obvious that any minute delineations must soon be obliterated by the agency of the weather. Most of them have the upper part of the head, the ears, or antlers, apparently too large—at least it appears so in the drawings. But this part, in the originals, is not raised from the ground so high as the other parts, and appears like several small parts trodden down and blended together. In the eighth figure, especially, there is a decided notch or separation still remaining between the two horns or ears. They are the favorite resort of badgers, which, finding them raised and dry, have selected them for burrowing; and it is wonderful that they retain their outlines so perfectly. But, above all other creatures civilized man will obliterate them the most speedily; and it is much to be regretted that the multitude of extraordinary figures raised like embossed ornaments over the whole of this part of the country, could not be accurately measured and delineated before they shall be obliterated for ever. The reader will please to observe that these observations were made, as it were, by stealth. I had other duties to perform, and was enabled to take these measurements by an enthusiasm which awoke me in my tent at midnight, assisted me to prepare my breakfast before day, and sent me into the cold bleak fields on a November morning, to finish the admeasurements of a whole group of figures before the usual time of commencing the labors of the day. I had no time to turn aside to examine still other groups, evidently more extensive and interesting than those which

we have endeavored to represent. Mr. Taylor has represented the effigies of birds, and one of the human figure, as occurring here ; and I am happy, with a full conviction of the general accuracy of his representations, to call the reader's attention to his interesting paper.

“On one of the hills I saw an embankment exactly in the form of the cross, as it is usually represented as the emblem of Christianity. Some of the surveyors brought in sketches of works in the form of birds with wings expanded ; and I heard of others in the form of lizards and tortoises. From what I have seen, I should think it very probable that these forms are to be found. But, in order that their existence should excite in the public that interest which, as relics of ancient history, they really possess, they should be so exactly surveyed and depicted that their representations can be relied upon with confidence. I object to the very careless and imperfect manner in which most of our antiquities have been examined, by which they have been rather guessed at than surveyed. Although I have given a pledge not to undertake to make animals of these figures, yet, to the eyes of all, except very sagacious people, they will look very like animals ; and the question will arise, what kinds of animals were intended to be represented ? In the originals, the size is so great, and the outline more or less obscured by herbage and undershrubs, that the impression of an effigy is much less decided than when the same is diminished and brought into one point of view, in which all the parts are under the eye at once. A comparison of the difference of expression, form, and attitude, does not strike one at all in the originals, while it is very decided in the diminished copies. Mr. Taylor suggests that those were intended to represent the buffalo, though he acknowledges the representation to be imperfect, especially in wanting the ‘hump.’ It appears to me that the

figures 1, 2, 3, and 6, might have been intended as effigies of the bear; the clumsy proportions, and want of the caudal appendage, appear like that animal. Figures 5, 7, and 8, have decidedly an expression of agility and fleetness. They may have been intended for the conger, or American tiger—an animal still existing in that region. The only general disproportion to that animal is the length of the head."

(C.)

CATALOGUE OF SOME OF THE PLANTS OF THE UPPER MISSISSIPPI

[*Mr. Geyer's List, with Additions.*]

Platanus,	Sycamore.
Catalpa.	
Several species of Anemone.	
Aquuligia,	Columbine.
Delphinium,	Larkspur.
Thalictrum,	Meadow Rue.
Menispermum,	Moonseed.
Nymphæa,	Water Lily.
Sanguinaria,	Bloodwort.
Nasturtiums, several species.	
Arabis,	Wall-cress.
Cardamine,	Ladies' Smock.
Dentaria,	Toothwort.
Erysimum,	Winter cress, hedge mustard.
Draba,	Whitlow grass.
Lepidium,	Cress.
Cleome.	
Polygala,	Milkwort, 3 species.
Violet, several varieties.	
Grass of Parnassus.	

Hypericum,
Arenaria,
Stellaria,
Spergula,
Linum,
Geranium maculatum,
Oxalis,

Celastrus,
Euonymus,
Rhamnus,

Ceanothus,
Vicia,
Lathyrus,
Phaseolus,
Glycyrrhiza,
Psoralia,

Amorpha.
Pelalostemon
Dalea.
Astragalus,
Bastard Vetch.
Lupinus,
Cercis,
Potentilla,

St. Johnswort.
Sandwort.
Stitchwort.
Spurry.
Flax.
Cranes' bill.
Wood sorrel
Grape.
Staff tree.
Spindletree.
Buckthorn. A variety of this
genus is used for tea among
the Chinese poor.
Red root, New Jersey tea.
Vetch.
Vetchling, everlasting pea.
Kidney bean.
Liquorice root.
There are several species,
viz., esculenta, argophylla,
cuspidata, lanceolata,—
called by the Canadians
pomme de prairie, pomme
blanche, and pomme de
terre.

Milk vetch, many varieties.

Lupin.
Redbud.
Cinquefoil.

Strawberry,	Fragaria.
Rosa,	Rose, blanda and lucida.
Cratægus,	Hawthorn.
Epilobium,	Willow herb.
Oenothera,	Tree primrose, many var.,— serrulata, cæspitosa, albi- caulis, pinnatifida, biennis.
Circæa,	Enchanter's nightshade.
Myriophyllum,	Water millfoil.
Hippuris,	Mare's tail.
Ribes, Ribesia and Grossularia,	Currant and gooseberry.
Hydrangea.	
Sium,	Water parsnip.
Aralia,	Spikenard.
Cornus,	Dogwood.
Galium,	Bedstraw—allied to madder.
Aster,	Starwort, 10 var.
Erigeron,	Fleabane, 6 var.
Solidago,	Golden rod, 8 var.
Ambrosia,	Bitterweed.
Xanthium,	Clot burr.
Helianthus,	Sunflower.
Helenium,	Sneezewort.
Achillea,	Millfoil.
Senecio,	Ragwort, 4 var.
Artemisia,	Wormwood, 7 var.
Sonchus,	Sow thistle.
Lactuca,	Lettuce, a new species not in Herbarium; arid banks of a lake formed by James' River.
Phellandrium Aquaticum,	Fine leaved water hemlock, an active medicine, delete-

- Leontodon,
 Mentha Viridis,
 " Pulegium,
 " Piperita,
 Wahu,
 Cornus sericea,

 Eupatorium perfoliatum,
 Ranunculus bulbosus,
 " Aquatilis.
 " Cymbalaria.
 " Sceleratus.
 " Repens.
 " Abortivus.
 Vitis riparia,
 Hieracium,
 Bear grape.
 Vaccinium tenellum,
 Lobelia,
 Campanula,
 Ash,
 Apocynum,
 Asclepias,
 Gentiana,

 Phlox.
 Heilotropium,
 Lithospermum,
- rious ; horses, on eating,
 become paralytic.
 Dent de lion.
 Spearmint.
 Pennyroyal.
 Peppermint.
 Indian arrow.
 Red willow, swamp dog-
 wood ; the liber is used by
 the Sauks for smoking,
 called Kinicanik.
 Thoroughwort, boneset.
 Buttercup.

 River bank grape vine.
 Hawkweed.

 The sugar whortleberry.
 Several var.
 Bellflower.
 Fraxinus.
 Indian hemp.
 Wild cotton, swallowwort.
 Gentian, 8 var. : the lutea,
 most esteemed in medi-
 cine, not one.

 Turnsol.
 Several species. The roots

	of some afford a lac for dyeing and painting.
Myosotis,	Scorpion grass.
Hydrophyllum,	Water leaf.
Lycopus,	Water horehound.
Monarda,	Mountain balm.
Hedeoma,	Wild pennyroyal.
Solanum nigrum triflorum,	Nightshade.
Physalis,	Ground cherry.
Pentstemon,	Several species. The grandiflorum, a beautiful species about 3 feet high, is found at Prairie Du Chien and other points.
Mimulus,	Monkey flower.
Gratiola,	Hedge hyssop.
Veronica,	Speedwell.
Pedicularis,	Lousewort.
Verbena,	Vervain.
Lysimachia,	Loosestrife.
Glaux maritima,	Saltwort.
Utricularia,	Bladderwort.
Plantago,	Plantain, 5 var.
Amaranthus,	Amaranth, prince's feather.
Chenopodium,	Goosefoot, wormseed.
Salsola,	Saltwort.
Salicornia,	Glasswort.
Rumex,	Dock, 4 var.
Polygonum,	40 var. (Persic., buckwheat).
Laurus benzoin,	Spicebush.
Eleagnus argentea,	Oleaster. A shrub from 8 to 12 feet high, producing

	a dry, farinaceous, edible drupe, about the size of a small cherry.
Shepherdia arg.,	Similar to above, called by the natives rabbit berry. Berries small, red, cluster- ed, succulent, acid.
Euphorbia,	Resembling cactus, 5 var.
Callitriche,	Water star.
Urtica,	Nettle.
Parietaria,	Pellitory.
Morus rubra,	Red mulberry.
Ulmus Americana,	American elm.
“ Fulva,	Slippery elm. Also one or two other species.
Ostrya,	Hop-horn-beam.
Salix,	Willow, many species.
Quercus,	Oak, many var. ; white, red, black, mountain, overcup white oak, burr, chinqua- pin, &c.
Juniperus,	Juniper.
Sisyrinchium,	Blue-eyed grass.
Cypripedium.	
Convallaria,	Lily of the valley.
Uvularia,	Lily, yellow lily.
Allium stel.,	Garlic.
“ angulosum.	
Erythronium,	Dog's tooth violet.
Trillium,	American herb Paris.
Smilax,	Green briar.
Triglochin,	Arrow grass.
Potamogeton,	Pond weed.

Arum,
 Sparganium,
 Juncus,
 Tradescantia,
 Alisma,
 Cyperus,
 Dulichium.

Scirpus,
 Carex,
 Alopecurus,
 Panicum,
 Stipa,

Agrostis,
 Poa,
 Festuca,
 Bromus,
 Triticum wheat,
 Elymus,

Atheropogon.
 Sesleria,
 Lepturus.
 Crypsis,
 Beckmannia,
 Andropogon,
 Struthiopteris,
 Equisetum,
 Baptisia tinctoria,
 Podophyllum,

Wake robin.
 Burr reed.
 Rush, 4 var.
 Spiderwort.
 Water plantain.
 Cypress grass.

Club rush.
 Sedge, 10 var.
 Foxtail grass.
 Panic grass.
 Silk grass, feather grass, long
 awned grass.

Bent grass.
 Meadow grass, 4 var.
 Fescue grass.
 Brome grass.
 Dog wheat.
 Wild rye. Also, a new species of Ely. Or a new genus between rye and barley.

Moor grass.

Thorn grass.
 Arrow grass.
 Beard grass.
 Fern.
 Horsetail.
 Wild indigo.
 May apple, otherwise called

- Silene,
 Ladies' slipper.
 Cassia marilandica,
 Datura stramonium,

 Black root.
 Rattlesnake's master
 Jerusalem artichoke
 Humulus lupulus,
 Hazel.
 Oxycoccus macrocarpus,
 " hispidulus,

 Acer, Maple.
 " Sugar Maple.
 Juglans,
 " Scaly Bark Hickory, *J. Cortice squamosa*.
 " Pignut Hickory.
 " Bitternut Hickory.
 " Swamp Hickory.
 Black Walnut.
 White Walnut ; or, Butternut, *Juglans cinerea*.
 Locust, black.
 " white.
 " honey.
 Cedar, red.
 Pinus, Pine.
 " white.
 " yellow.
- mandrake, wild lemon,
 duck's foot.
 Wild pink.

 American senna.
 Devil's apple, Jamestown
 weed, thorn apple.

 Hop.

 The red cranberry.
 White do., similar to
 gaultheria, or partridge
 berry, called mountain tea,
 used as substitute.

Pinus, black.

“ spruce.

Prickly Ash, *Xanthoxylum Fraxineum*.

Wild Plum.

Wild Cherry.

Crab Apple.

Raspberry.

Blackberry.

Dewberry.

Sumach, *Rhus*

Hemp.

Isopyrum.

Actaea rubra.

Uvaria triloba.

Leontice.

Corydalis.

Dielytra.

Sisymbrium.

Stanleya.

Capsella.

Polanisia.

Hudsonia.

Claytonia, Chickweed.

Xanthoxylum, Amer.

Rhus triloba.

Sida, coc.

Hosachia.

Oxytropis.

Phæa.

Homalobus.

Desmodium.

Schranbia.

Darlingtonia.

Pencedanum.

Polytœnia.

Osmorhiza.

Syrphoricarpus.

Vernonia

Liatris.

Kuhnia.

Boltonia.

Gutierrezia.

Aplopappus.

Grindelia.

Chrysopsis.

Silphium.

Iva axil.

Echinacea.

Rudbeckia.

Lepachis.

Copeopsis tinct.

Dysodia.

Gaillardia.

Hymenophyllum.

Antennaria, everlasting.

Chamaerodos.	Cirsium, 4 var
Geum.	Nabalus, 3 var.
Amelanchier.	Lygodesmia.
Gaura, coc.	Troximon.
Menzelia, orn.	Forestiera.
Zizia, aur.	Acerates, vir. flo.
Thaspium.	Collomia.
Navaretia.	Comandra.
Convolvulus stans.	Peristylus.
Evolvulus Arg.	Spiranthes.
Echinosperrum.	Ammianthium.
Onosmodium.	Zigadenus, Helonias.
Ellisia.	Elocharis.
Lophantus.	Muhlenbergia.
Physostegia.	Vilfa.
Androcera.	Calamagrostis.
Chelone.	Arundo.
Monniera.	Spartina.
Gerardia.	Aristida.
Othocarpus.	Catabrosa.
Castilleja.	Kœleria.
Orobanchè.	Glyceria.
Oxybaphus, Umbrella Wort.	Uniola.
Kochia.	Polypodium.
Obione.	Asplenium.
Atriplex.	Marsilea.

TABLE OF GEOGRAPHICAL POSITIONS.

Mississippi River at low water.

Places of observation.	Estimated distances by water.		Altitudes above the Gulf of Mexico.*	North latitude.	West of Greenwich.		Authorities, &c.
	From place to	From the Gulf of Mexico.			Longitudes in arc.		
	Miles.	Miles.	Feet.	° ' "	° ' "		
New Orleans Cathedral, and level of its front pavement	104	104	10.5	29 57 23	89 59 4		
Red River, north end of the island, opposite the mouth	236	340	76	31 2 25	91 41 15	Nicollet do.	
Natchez, light-house	66	406	86	31 33 37	91 28 22.5	Ferrer.	
Yazoo River, the mouth	128	534	—	32 28 0	90 59 30	Nicollet.	
White River, Montgomery's Landing, one mile above the mouth	220	754	202	33 57 20	90 26 45	Ferrer.	
New Madrid, Missouri	361	1,115	—	36 34 30	89 97 15	Ferrer's longitude.	
Ohio River, north side of the mouth	101	1,216	324	37 0 25	89 2 30	Long's first expedition.	
Cape Girardeau	41	1,257	—	37 18 39	89 17 0		
St. Genevieve, Catholic church, and level of its pavement	73	1,330	372	37 59 47	90 11 10	Nicollet.	
St. Louis, garden of the cathedral	60	1,390	382	38 37 28	90 15 39	do.	

* The numbers in this column refer to the surface of the water in the Mississippi at the point mentioned, except when otherwise especially expressed.

(D.)

(D.)—Continued.

Table of Geographical Positions—Mississippi River at low water—Continued.

Places of observation.	Estimated distances by water.		Altitudes above the Gulf of Mexico.	North latitude.		West of Greenwich.		Authorities, &c.
	From place to	From the Gulf of Mexico.		° ' "	° ' "	Longitudes in arc.		
	Miles.	Miles.	Feet.	° ' "	° ' "	° ' "	Long's first expedition.	
Illinois River, the mouth	36	1,426	-	38 58 12	-	-	Nicollet.	
Moingonan River (Des Moines River), a small island at the mouth	168	1,594	444	40 21 43	91 32 30			
Montrose, or old Fort Des Moines, the mouth of the creek	15	1,609	470	40 30 34	91 31 0		do.	
Flint River, the mouth above Burlington	30	1,639	486	40 52 56	-		do.	
Maskudeng, the middle mouth of the slough	39	1,678	505	41 14 47	91 21 30		do.	
Rock Island, a quarter of a mile above Davenport's residence	44	1,722	528	41 31 50			do.	
Head of the Upper Rapids, below Port Byron and Parkhurst	15	1,737	554	41 36 8	90 29 0		do.	
Prairie du Chien (Kipi-saging), American Fur Company's house	195	1,932	642	43 3 6	91 9 19.5		do.	
Summit of bluff on the eastern side of Prairie du Chien	-	-	1,010				do.	
Upper Iowa River, island at the mouth	46	1,978	-	43 29 26	91 10 0		do.	
Sappah River, or Black River, opposite the old mouth	57	2,035	683	43 57 14	91 24 0		do.	

(D.)—Continued.

Top of mountain on right bank, opposite the old mouth -	-	-	1,214	-	-	-	-	do.
Dividing-ridge between Sappah River and Prairie à la Crosse River, 6 miles east of Missi- sippi -	-	-	1,103	-	-	-	-	do.
Mountain island, or Montagne qui trempe à l'Eau of the French -	7	2,042	-	44	1 7	91 30	30	do.
Miniskah River, or White-water River -	27	2,069	-	44	12 36	91 51	15	do.
Reminichia (Montagne la Grange of the French) upper end of Lake Pepin -	46	2,115	714	44	33 30	92 31	0	do.
Top of Reminichia -	-	-	1,036	-	-	-	-	do.
Lahontan River, the mouth—(Cannon River of the Americans, Canoe River of the French) -	3	2,118	-	44	34 0	92 32	0	do.
St. Croix River, the mouth -	32	2,150	729	44	45 30	92 45	0	do.
St. Peter's, the mouth -	42	2,192	744	44	52 46	93 4	54	do.
General level of the plateau on which Fort Snelling and the Indian agency stand -	-	-	850	-	-	-	-	do.
Pilot Knob, the top -	-	-	1,006	-	-	-	-	do.
Falls of St. Anthony, U. States cottage -	8	2,200	856	44	58 40	93 10	30	do.
Ishkode-wabo River, or Rum River, the mouth -	19	2,219	-	45	15 0	-	-	do.
Karishon River (Sioux), or Undeg River (Chippeways), Crow River of the Americans -	10	2,229	-	45	16 0	-	-	do.
Wabezi, or Swan River, a half mile above the mouth -	112	2,341	1,098	45	54 30	94 22	0	do.
Kagi-wigwan River, the mouth (Aile de Corbeau River of the French—Crow- wing River of the Americans) -	40	2,381	1,130	46	16 50	94 22	45	do.

(D.)—Continued.

Table of Geographical Positions—continued.

Places of observation.	Estimated distances by water.		Altitudes above the Gulf of Mexico.	North latitude.		West of Greenwich.		Authorities, &c.
	From place to.	From the Gulf of Mexico.		°	'	°	'	
Kabikons, or Little Falls, the head of the falls - - -	Miles. 246	Miles. 2,627	<i>Feet.</i> 1,340	47	14	93	26	Nicollet.
Wanamon River, or Vermilion River, the mouth - - -	21	2,648	-	47	11	4	45	
Eagle Nest savannah (Marais aux Nids d'Aigle of the French) - - -	16	2,664	-	47	18	10	93	
Leech Lake River, the mouth - - -	11	2,675	1,356	47	14	0	93	
Lake Cass, the old trading-house on a tongue of land near the entrance of the Mississippi - - -	80	2,755	1,402	47	25	23	94	
Pemidji Lake or Lake Travers, the entrance of the Mississippi - - -	45	2,800	1,456	47	28	46	94	
Itasca Lake, Schoolcraft's island - -	90	2,890	1,575	47	13	35	95	
Utmost sources of the Mississippi, at the summit of the Hauteurs de Terre, or Dividing-ridge, between the Mississippi and Red River of the north - -	6	2,896	1,680					

(D.)—Continued.

TABLE OF GEOGRAPHICAL POSITIONS.

Region of the sources of the Mississippi.

Places of observation.	Altitudes above the Gulf of Mexico.	North lati- tudes.	West of Greenwich.		Authorities, &c.
			Longitudes in arc.		
	<i>Feet.</i>	46° 18' 50"	94° 26' 0"	Nicollet.	
Gayashk River, or Little Gull River, the mouth -	1,131	46 24 28	94 22 30	Do.	
Gayashk Lake, or Little Gull Lake, end of Long Point -	1,152				
Kadiconag Lake, or White Fish Lake, the entrance of Pine River -	1,192	46 40 25	94 2 30	Do.	
Lake Chanché, southwest end -	-	46 46 35	-	Do.	
Lake Eccleston, northwest end -	-	46 57 0	-	Do.	
Leech Lake, Otter Tail Point -	1,380	47 11 40	94 20 0	Do.	
Leech Lake, the bay opposite Otter Tail Point -	-	47 7 22	94 22 0	Do.	
Kabekonang River, the junction of the upper fork, near the next-mentioned portage -	1,406	47 16 0	-	Do	
Portage from Kabekonang River to La Place River, near the west end -	1,540	47 15 0	-	Do.	
Assawa Lake, below the south end -	1,532	47 12 10	94 55 0	Do.	
Highest ridge on the portage between Assawa Lake and Itasca Lake -	1,695	-	-	Do.	
Cleared Pine Camp, on Leech Lake River -	-	47 13 0	94 0 0	Do.	

TABLE OF GEOGRAPHICAL POSITIONS.

Northwest region of Lake Superior.

Places of observation.	North latitudes.	W of Greenwich		Authorities, &c
		Longi. in arc.		
Fort William - - - - -	48° 23' 28"	89° 19'	49"	Sir J. Franklin and J. Ferguson. James Ferguson.
Grand Portage, east end - - - - -	47 57 38	89 49	35	
Grand Portage, west end (Fort Charlotte) - - - - -	47 58 34	89 59	31	
Grouse Portage, or <i>Portage aux Outardes</i> , east end - - - - -	47 59 2	-	-	Do.
Portage to Arrow River, east end - - - - -	48 5 7	-	-	Do.
Portage of Height of Land, west end - - - - -	48 5 48	-	-	Do.
Island of Height of Land - - - - -	48 6 21	-	-	Do.
Island in the Strait - - - - -	48 12 58	-	-	Do.
Island at the entrance of Saganaga - - - - -	48 13 23	-	-	Do.
Marked Rock, near the southeast end of the Strait - - - - -	48 11 32	-	-	Do.
Island in Lac La Croix - - - - -	48 16 11	92 4	4	Do.
Island in Lac La Croix - - - - -	48 20 43	92 19	0	Do.
Rainy Lake River, Hudson Bay Company's fort - - - - -	48 36 18	98 28	33	Sir J. Franklin.
Mouth of Rainy Lake River, or <i>Rivière Lac à la Pluie</i> of the French - - - - -	48 53 16	94 45	46	James Ferguson.
Point in Namekom Lake - - - - -	48 26 44	-	-	Do.
Portage du Rat, outlet of Lake of the Woods - - - - -	49 47 49	94 26	49	Do.

(D.)—continued.

(D)—Continued.

TABLE OF GEOGRAPHICAL POSITIONS.

Southwest region of Lake Superior.

Places of observation.	Altitudes above the Gulf of Mexico.	North latitude.	W of Greenwich Longi. in arc.	Authorities, &c.
Madeleine Island, the trading-house and level of the lake (depth of Lake Superior, according to the British Ad- miralty survey, 792 feet)	<i>Feet.</i> 620	46° 47' 10"	90° 53' 30"	Nicollet.
St. Louis River, the trading-house called Fond du Lac, but about 24 miles up stream from the true Fond du Lac	—	46 39 50	92 15 20	Do.
Culmination of the Grand Portage, on St. Louis River	1,066	—	—	Do.
Upper end of the Grand Portage, on St. Louis River	984	46 49 42	92 25 0	Do.
Head of the Long Rapids, on St. Louis River	—	—	—	Do.
East Savannah River, the mouth	1,264	—	—	Do.
Dividing-ridge between East and West Savannah Rivers - Portage between Wissakude, or Burnt Wood River, and the head of St. Croix River, emptying into the Mississippi	1,334	—	—	Do.
Porcupine Hills (Wisconsin Mountain), 330 yards above the lake	956	—	—	Do.
Head of the Kettle Rapids, or Akkik Rapids, on St. Croix River	1,610	—	—	British Admiralty survey.
Falls of St. Croix River	—	45 54 40	—	Nicollet.
Kettle-kittigan Lake, or Lac Vieux Desert, south island	—	45 30 10	92 40 0	Capt. T. J. Cram.
Kawasidjiwong River (Montreal River), the mouth	—	46 7 31	89 20 13	Do.
" " " " the head	—	46 33 0.5	90 44 30	Do.
" " " " " "	—	46 18 38	90 24 38	Do.

(D.)—Continued.

TABLE OF GEOGRAPHICAL POSITIONS.
St. Peter's, or Mini-sotah River.

Places of observation.	Estimated distances by water.		Altitudes above the Gulf of Mexico.	North latitude.	West of Greenwich.		Authorities, &c.
	From place to place.	From the mouth of St Peter's R'r.			Longitudes in arc.		
	Miles.	Miles.	Fect.				
Mouth of St. Peter's, Indian Agen., near Ft. Snelling	—	—	744	44° 52' 46"	93° 4' 54"	Nicollet.	
Witakantu River, or High Island River, the mouth	78	78	—	44 36 0	93 51 45	Do.	
Oeynwajah (Traverse des Sioux), the trading-house	38	116	793	44 21 15	93 68 0	Do.	
Mankato River, or Blue Earth River, the mouth	32	148	—	44 9 6	—	Do.	
Waraju River, or Rivière aux Liards of the French, the mouth	42	190	811	44 16 20	94 24 30	Do.	
Mouth of Lost Channel, bet. Chapah & Red Wood R's.	68	258	—	44 34 40	95 1 30	Do.	
Patterson Rapids	—	—	—	44 39 50	—	Do.	
Petitazizi River, or Yellow Medicine River, and Chetambey Riv. (Eau de Vie River), bet. the two mouths	34	292	—	44 46 4	95 27 0	Do.	
Falls of St. Peter, amidst the rapids	—	—	—	44 50 0	—	Do.	
Man-yah-Wakan River (Chippeway River), the mouth	32	324	—	44 57 40	95 45 6	Do.	
Iyedan Lake, or Lac-que-parle of the French, Renville's trading-house	26	350	946	45 1 34	95 54 33	Do.	
Tipisnah River, or Rivière Pommes de Terre of the French	18	368	—	45 10 21	96 4 0	Do.	
Injian-tanka, or Big Stone Lake, the south creek below the bend of the lake	45	413	966	45 23 0	—	Do.	
Sources of St. Peter's, Aug. 16, 1839, level of lake	57	470	1,896	45 47 58	97 19 30	Do.	

* The numbers in this column refer to the surface of the water in the St. Peter's, at or near the point indicated, except when otherwise specially expressed.

(D.)—Continued.

Places of observation.	Altitudes above the Gulf of Mexico.	North latitude.	West of Greenwich.		Authori- ties, &c.
			Longitudes in time.	Longitudes in arc.	
	<i>Feet.</i>		<i>h. m. s.</i>		
Ridge dividing the head-waters of St. Peter's and Tchan-kasdata, or Sioux River, at the head of the Coteau des Prairies - - -	2,046	44° 51' 5"	-	-	Nicollet.
Station at the fork of Chetambey River - - -	-	44 21 40	-	-	Do.
Lac aux Jones,—Little Rock River - - -	-	44 26 43	-	-	Do.
Mini-sotah Lake (Lac à l'Eau Claire of the French) -	-	44 6 30	-	-	Do.
Mouth of Rivière Le Sueur, on Mankato, or Blue Earth River - - -	-	44 6 26	6 16 36	94° 9' 0"	Do.
Blue-earth Locality, on the left bank of Mankato River	-	44 3 52	6 16 44	94 11 0	Do.
Station on the left bank of Mankato River, between the Watonwan River and Blue-earth Locality -	-	44 1 0	6 16 44	94 11 0	Do.
Mouth of Watonwan River, on the left bank of Man- kato River - - -	-	43 57 50	6 16 40	94 10 0	Do.
Man-yah Kichaksey, or Cut Cliff; or l'Ecore Coupée of the French - - -	-	43 54 49	-	-	Do.
Station on the left bank of Mankato River, between Man-yah and Repah Kichaksey - - -	-	44 4 45	6 18 12	95 33 0	Do.
Hauska Lake, or Long Lake, eastern end - - -	-				

(D.)—Continued.

TABLE OF GEOGRAPHICAL POSITIONS.

Missouri River at low water.

Places of observation.	Estimated distances by water.		Altitudes above the Gulf of Mexico.	North latitudes.	West of Greenwich.		Authorities, &c.
	From place to	From the Gulf of Mexico.			Longitudes in arc		
	Miles.	Miles.	Feet.				
Mouth of Missouri River, the south bank, 18 miles above St. Louis	-	1,408	388	38° 50' 50"	90° 13' 45"	Nicollet.	
Goebel's residence, near Newport, Franklin county, Missouri	-	-	-	38 33 58	91 7 9	D. W. Goebel.	
Gasconade River, the mouth	105	1,513	-	38 41 40	-	Lewis and Clarke.	
Portland, Callaway county, Missouri, left bank of Missouri River	10	1,523	-	38 42 57	91 40 15	Nicollet.	
Ozage River, the mouth	20	1,543	-	38 35 0	-	Lewis and Clarke.	
Nashville, Boone county, left bank	36	1,579	-	38 47 7	92 49 30	Nicollet.	
Boonville, Cooper county, right bank	25	1,604	530	38 57 18	92 41 30	do.	
Grand River, southwest of the mouth	66	1,670	-	39 19 0	-	do.	
Old Fort Osage, right bank	78	1,748	-	39 9 33	-	Major Long's first expedition.	
Lower Liberty landing	22	1,770	-	39 11 43	94 20 15	Nicollet.	
Kansas River, the mouth	20	1,790	-	39 5 25	-	Lewis and Clarke.	
Fort Leavenworth, the landing-place	30	1,820	746	39 22 40	94 44 0	Nicollet.	

(D).—Continued.

	9	1,829	-	39	25	5		Major Long's first expedition.
Cow Island -	-	-	-	-	-	-	-	Nicollet.
Sand-bar, 18 miles above Fort Leavenworth—above the Old Cut-off	-	1,838	-	39	29	42	95	1 0
Black Snake hill, the landing	-	1,876	797	39	44	23	94	47 30
Antelope Island	-	1,924	-	40	4	23	95	19 30
Nishnabtona River, opposite the mouth	24	1,948	-	40	16	50	95	25 0
Bald Island, lower end, and western side	29	1,977	-	40	34	0	95	34 30
Five-Barrel Islands	31	2,008	972	40	49	44	95	42 0
Hill on the right bank at Five-Barrel Islands	-	-	1,152	-	-	-	-	do.
Platte River, north side of the mouth	18	2,026	-	41	3	24	-	Major Long's first expedition.
Engineer Cantonment	-	-	-	41	25	4	95	43 52.5
Island three miles below Council Bluffs by water	-	-	-	-	-	-	-	Maj. J. D. Graham.
Inyan-yanke River (Little Sioux River), three miles below the mouth	55	2,081	1,023	41	28	20	95	45 30
Wood's Hills, old trading-house	78	2,159	-	41	47	0	95	54 0
Floyd's Grave, top of the river bank	38	2,197	-	42	0	49	96	7 0
Huppan-kutay, Prairie, left bank, one mile above American Fur Company's trading-house	66	2,263	1,253	-	-	-	-	do.
Hills on the right bank, two miles below the preceding station	65	2,328	1,217	42	44	25	96	41 51
Ponkah River, one mile below the mouth, left bank of Missouri River	-	-	1,540	-	-	-	-	do.
Nawizi River, near the mouth	98	2,426	-	42	50	0	-	do.
Wichapa-pah, or Scalp Mountain Creek, two miles above the mouth	5	2,431	-	42	51	40	-	do.
Rantesha-wita, or Red Cedar lower end, opposite Bad Creek	45	2,476	-	43	8	33	98	37 0
	14	2,490	1,296	43	14	24	98	47 45

$$\begin{array}{r} 18 \\ 4 \\ \hline 72 \end{array}$$

(D.)—Continued.

TABLE OF GEOGRAPHICAL POSITIONS.

Missouri River at low water.

Places of observation.	Estimated distances by water.		Altitudes above the Gulf of Mexico.	North latitude.	West of Greenwich.		Authorities, &c.
	From place to	From the Gulf of Mexico.			Longitudes in arc.		
	Miles.	Miles.	Feet.				
Hills on the right bank of Red Cedar Island—							Nicollet.
First range	-	-	1,522	-	-	-	do.
Second range	-	-	1,876	-	-	-	do.
Third range	-	-	2,033	-	-	-	do.
Sailor Island, one mile below	36	2,526	1,314	43 38	99 8	0	
Hills on the left bank, between Sailor Island and White River, viz:							
Top of the Black Zone (pseudo volcano)	-	-	1,532	-	-	-	do.
Top of the upland, or Biyou's Hills	-	-	1,738	-	-	-	do.
Mankizita, or White River, the mouth	11	2,537	-	43 41	99 12	0	do.
Lower Island, or beginning of the Great Bend	45	2,582	-	44 9	99 20	0	do.
Dry Wood River, one mile below the entrance	34	2,616	-	44 7	99 31	30	do.
Fort Pierre Chouteau, on the right bank	48	2,664	1,456	44 23	100 12	30	do.
Highest point, northeast, two miles from Fort Pierre, on the opposite bank	-	-	1,960	-	-	-	do.

